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Hydrologic Report of Reedy Creek Basin and Preferred Database Development

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EXECUTIVE SUMMARY

This report provides a statistical analysis and comprehensive summary of hydrologic data for the Reedy Creek Basin (RCB) part of the Upper Kissimmee River Watershed (UKRW). Hydrologic data pertaining to this basin exist in the South Florida Water Management District database, DBHYDRO. These data are mainly time series of Flow, Rainfall, Stages, and Evaporation. Time-series data are sometimes interrupted by gaps of missing or questionable data. Missing data estimation and a data summary are essential for hydrologic investigations.

In this study, a correlation and regression analyses were performed for flow data sets at several stations along the flow route in the RCB. The results of these analyses were used to estimate the missing flow data within the RCB. The improved uninterrupted flow data are stored in new database keys called "preferred keys". The representation of data includes statistical measures, summary tables, and graphic presentation. Time series were also summarized into basic monthly statistics such as Mean, Median, Standard Deviation, Minimum, and Maximum. Time series plots of the historical hydrologic data are also presented.

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ACKNOWLEDGEMENTS

The author wishes to thank Nagendra Khanal, Daniel Downey, Wossenu Abtew, Linda Lindstrom, and Hedy Marshall for providing useful comments for this report. The review and suggestions provided by Jim Carnes and Steve Lin have improved this work significantly. The efforts by Janet Wise and Diane Smith in providing the maps included in this report are greatly acknowledged.

INTRODUCTION

The Ready Creek Basin (RCB) is the second largest sub-basin in the Upper Kissimmee River Watershed (UKRW). The RCB occupies the northwestern section of UKRW with a total area of 269.0 square miles approximately (the same size as Lake Kissimmee Basin). A large number of small lakes and creeks occupy the northern part of the RCB. Wide, flat swampy valleys and marshlands cover many areas in the RCB. Due to poor drainage system, rainfall is accumulated and retained over these areas for long periods before it reaches the creeks. Reedy Creek (RC) runs southeast for 29 miles carrying most of the RCB water to either Lake Hatchineha (the main branch) or Lake Cypress. This water is a significant source of inflow to Lake Kissimmee. The Reedy Creek Swamps south to Bonnet Creek release some "unquantified" flow eastward across the RCB-Shingle Creek Basin divide.

Preliminary review shows that hydrologic data pertaining to the RCB contain many gaps. Such gaps range from a few days to several months. A complete data set for the entire period of record is often needed to conduct hydrologic investigations. While each investigation may estimate the missing data using some objective and/or subjective tool, it is preferred that one common estimation procedure be used among all investigations to ensure consistency. Therefore, one set of complete data sets is created and stored in "preferred" database keys. A database key (dbkey) is a retrieval address assigned to a data set stored in DBHYDRO. The preferred dbkey pertains to improved uninterrupted time series within the period of record that can be used for all hydrologic investigations.

This report is the second in a series of studies that estimate missing data and provide hydrologic data summaries for the UKRW sub-basins. The main objectives are to: 1) reconstruct the flow route within the RCB and, subsequently, develop flow preferred database keys; and 2) summarize the historical hydrologic data.

The main body of this report consists of four sections covering the four hydrologic components (Flow, Rainfall, Stage, and Evaporation) in the UKRW. In each section, the available data are first presented. When applicable, data estimation methods for preferred key development are developed. Data summary and relevant statistics are then provided.

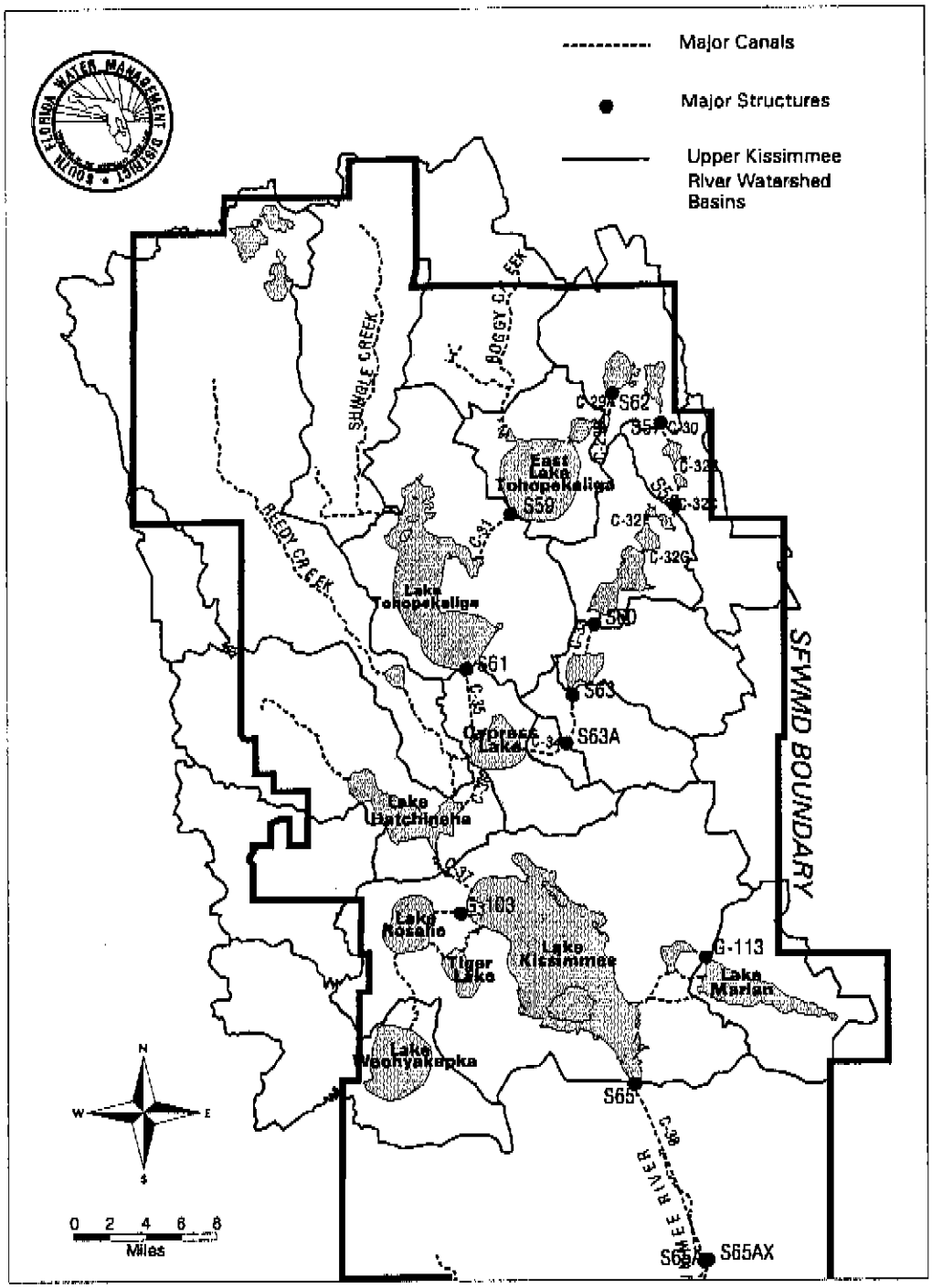

Figure 1a. Upper Kissimmee River Watershed.

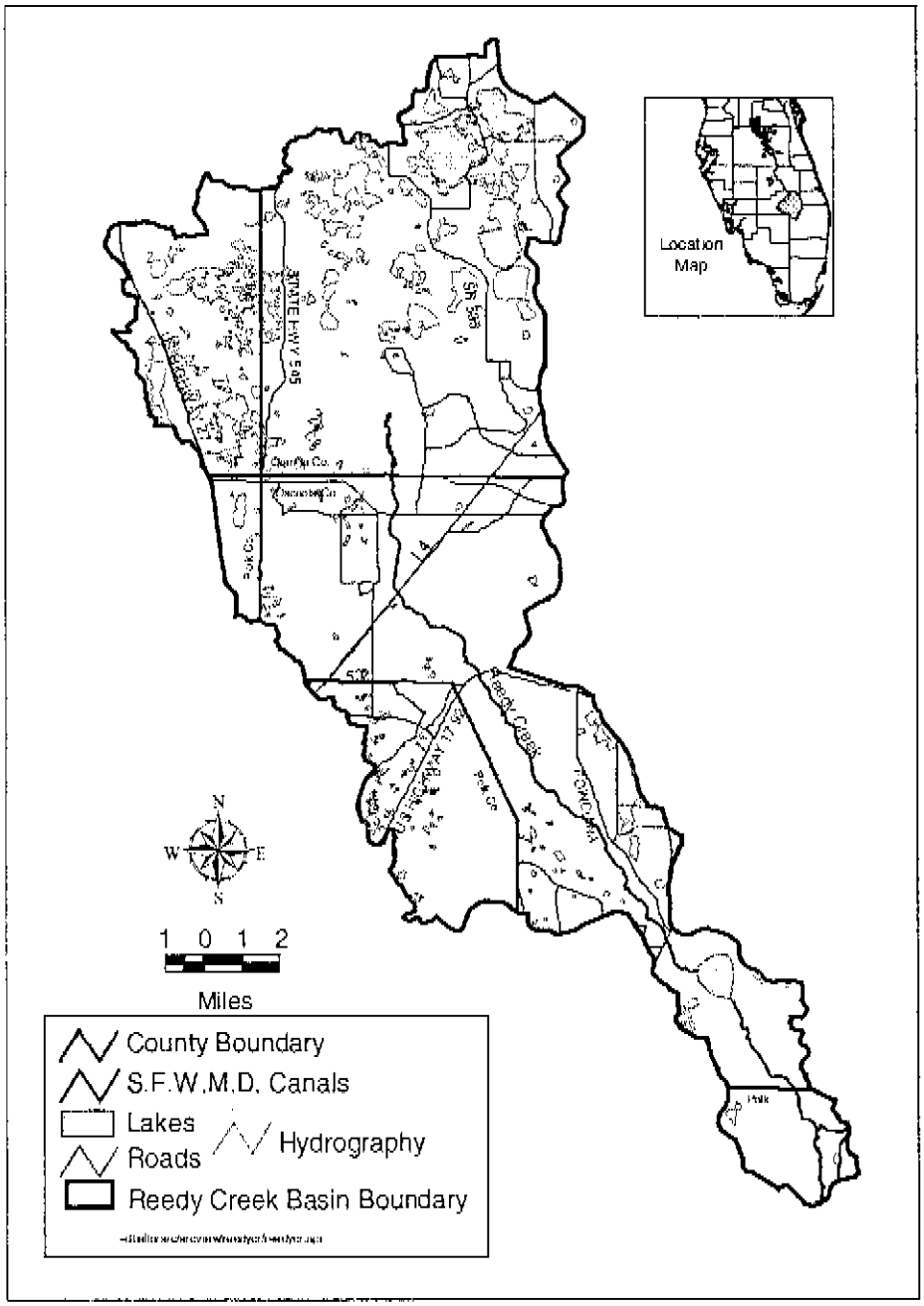

Figure 1b. Reedy Creek Basin.

FLOW

There are numerous inflow components to RC from small lakes and local creeks within the RCB. The hydrologic relationships among these components are not well documented. The evaluation of such relationships is essential for missing flow data estimation. In this section, the objectives are: 1) to develop preferred database keys after estimating missing data and 2) to provide a hydrologic data summary. Information about the available data is first provided followed by an interpretation of a possible flow routing scenario based on correlation analysis. Presentations of the missing data estimation procedures as well as the results are then provided.

Available Data

Many flow stations were found within the RCB. Table 1 and Figure 2 present detailed information and spatial locations of these stations. There are 10 locations and eleven stations (WHITTENHORSE has two stations). WHITTENHORSE411 station was dropped due to clearly poor quality data. Bay Lake station did not have any missing data within its period of record. The Reedy Creek station data at Florida Highway were found questionable, as the monthly flow statistics for these data were too high in the low flow period January through April (see Figure 12b). Therefore, this station was not considered in this study. The remaining eight stations have different periods of record with a lot of missing data. The periods of record start as early as 1922 and end as late as 1996. An extended period of missing records was found at the beginning of stations Bonnet Creek and RC (Vineland). Such periods of record were eliminated from the time series. Similar periods of missing record were found within the main period of record for two other stations (RC (Loughman) and LAT1.01). Three years of missing data were accrued in a 5-year period of record at station LAT.101. This station was not used to estimate missing data at other stations. However, other stations were used to estimate the gaps at station LAT.101. The estimation of the missing data is presented below.

Flow Routing in Reedy Creek Basin

The Reedy Creek Basin consists of flat and wide swampy valleys where many lakes, marshlands, and swamps retain a large amount of water. The drainage system in this area is so poor that water is retained for long periods before flowing to the creeks. Reedy Creek receives inflow from three major streams: Bonnet Creek, Whittenhorse Creek, and Davenport Creek. Bonnet Creek receives flow from Cypress Creek, Bay Lake, and South Lake. Detailed discussion about the hydrologic conditions in the Reedy Creek Basin can be found in a USGS report prepared in cooperation with the Reedy Creek Improvement District, 1986.

Preferred Key Development

To predict missing flow data at a given location, a relationship between this location and the nearby locations must first be established. This relationship depends on the spatial and temporal flow behavior in the surrounding area. This behavior has

significantly been altered since 1967 due to the construction of many canals and flow-control structures within the RCB. Therefore, to assure statistical homogeneity, the data were categorized into pre-67 and post-67 data sets.

Pre-67 Data

Table 1 shows two stations, Cypress and RC (Loughman), with period of record prior to 1967. RC (Loughman) receives flow from Cypress Creek through Bonnet Creek. The maximum correlation between $Q_{cypress}$ and $Q_{loughman}$, the flows at the two stations, is 0.74 with one-day lag. The corresponding linear regression equation is:

$$Q_{cypress} = -1.6+0.133*Q_{loughman} \quad (1)$$

Post-67 Data

Post-67 data include all remaining stations and the remainder of Cypress and RC (Loughman) data (see Table 1). Missing period of record at a given station is filled using data at nearby stations. A closer station is used first unless the period of record is also missing at that station. The linear relationship between an upstream station flow (Y) and downstream station flow (X) is given as:

$$Y = a + b * X \quad (2)$$

This relationship was evaluated for 8 station pairs to estimate missing flow data at the stations presented in Table 1. The estimated parameters, a and b, along with the maximum correlation and the associated lag for these pairs are given in Table 2. The preferred flow time series for these stations, after estimating the missing data, and Bay Lake station are presented in Figures 3a through 11a. The corresponding preferred dbkey for each station is presented in Table 1. Figure 12a presents time series for the RC Florida Highway station (no preferred dbkey was developed for this station).

Table 1. Information about stations with flow records within Reedy Creek Basin.

Station	Dbkey	Method	Starting date	Ending date	Latitude	Longitude	Preferred Dbkey
BAY-2	00120	Daily Mean	1968	1971	282448	813327	J6167
South Lake.	00123	Daily Mean	1972	1995	282445	813217	J6168
Cypress	00128	Daily Mean	1945	1995	282325	813111	J6169
Whittenhorse	00141	Daily Mean	1966	1995	282305	813700	J6170
Whittenhorse 411	15192	Daily Mean	1990	1995	282305	813700	Dropped
Lat.101	15190	Daily Mean	1990	1995	282215	813145	J6171
Bonnet Creek	00131	Daily Mean	1942	1995	281958	813120	J6172
RC Vineland	00156	Daily Mean	1966	1995	281957	813448	J6173
Davenport Creek	00162	Daily Mean	1969	1995	281615	813528	J6174
RC Loughman	00165	Daily Mean	1939	1996	281548	813212	J6175
RC, Florida Hwy.	06808	Daily Mean	1983	1991	280858	812628	Dropped

Data Summary

The associated monthly statistics for the flow time series shown in Figures 3a through 11a, are presented in Figures 3b through 11b and Figures 5c and 10c. Figure 12b presents flow statistics at Florida Highway station. From these figures, it is noticed that:

1) Monthly mean is highest during August and September and is lowest during April, May and June;
2) The median is, in general, significantly lower than the average;
3) The monthly standard deviation is sensitive to the monthly maximum.
4) Flow monthly statistics at the Florida Highway station are too high during the low flow season (January through April).

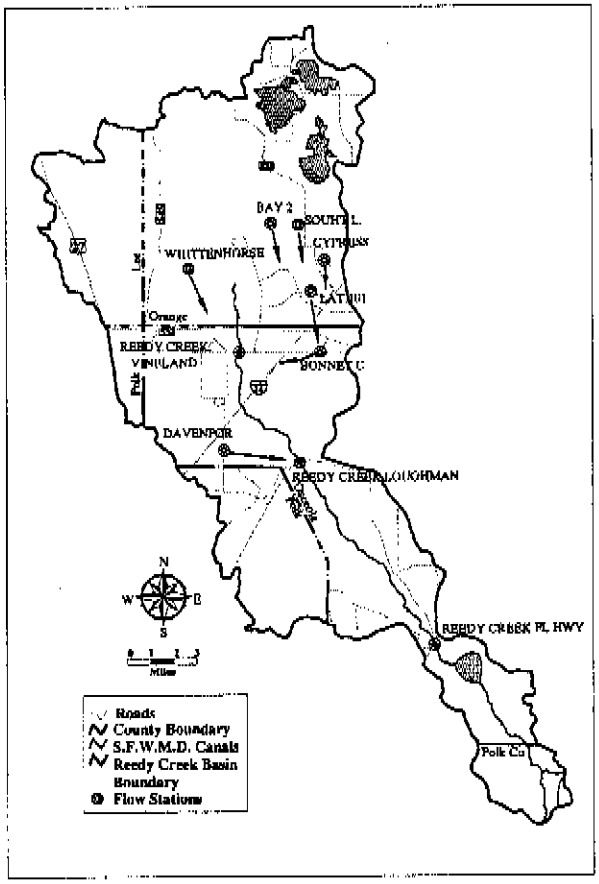

Figure 2. Flow stations and the flow route within the RCB.

Table 2. Correlation results and regression coefficients for eight station pairs.

Y (upstream)	X (downstream)	Correlation	Lag (days)	Intercept (a)	Slope (b)
Lat	Bonnet Creek	0.72	0	0.40	0.425
South Lake	RC Loughman	0.335	1	-0.029	0.007
Cypress Creek	Bonnet Creek	0.62	0	-0.58	0.17
Cypress Creek	RC Loughman	0.62	0	-0.58	0.17
Bonnet Creek	RC Loughman	0.64	4	7.20	0.32
Davenport	RC Loughman	0.76	3	1.85	0.18
RC Vineland	RC Loughman	0.69	3	9.99	0.513
Whittenhorse	RC Vineland	0.69	0	1.84	0.0105

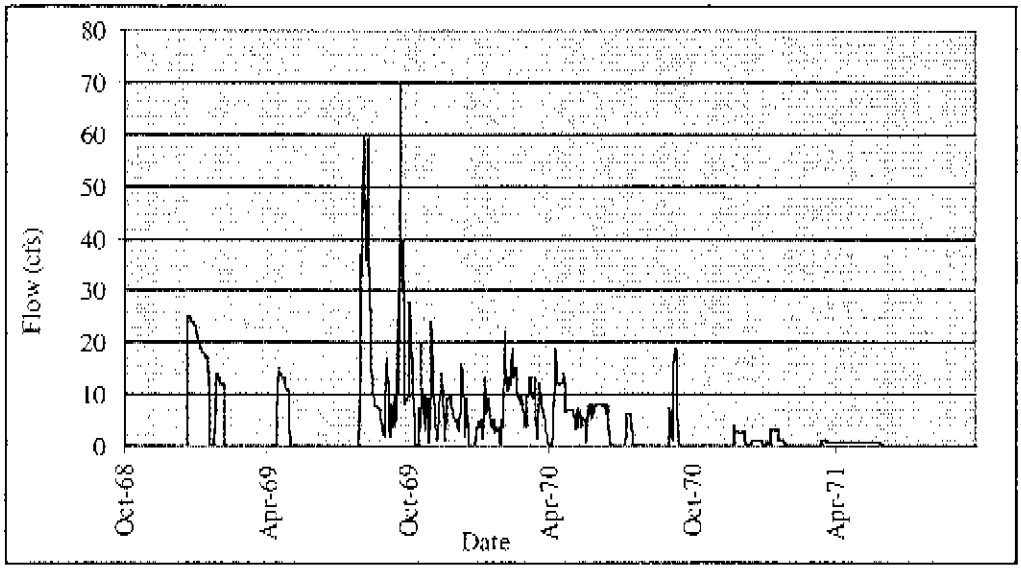

Figure 3a. Preferred flow data at Bay Lake outlet station.

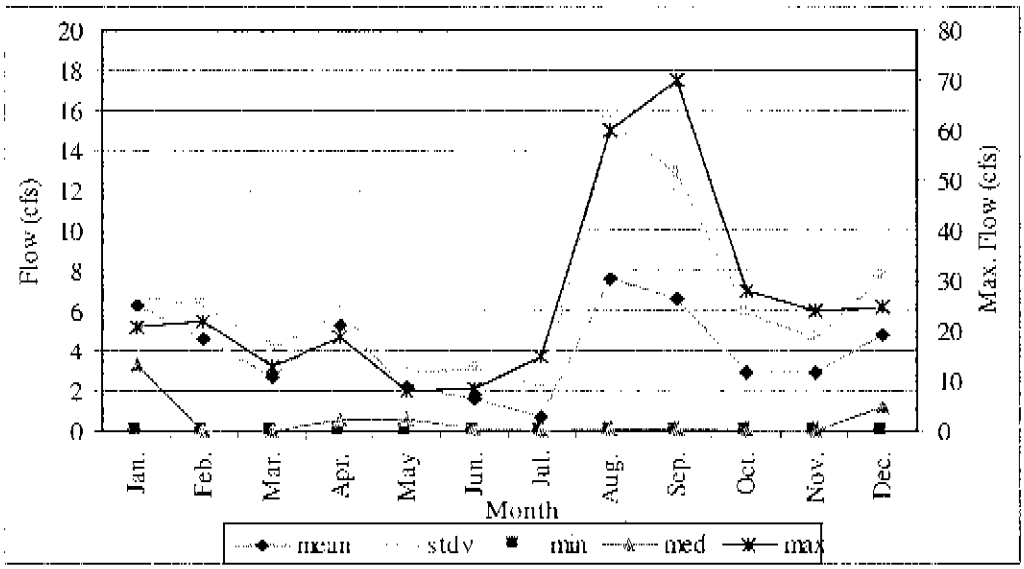

Figure 3b. Flow monthly statistics at Bay Lake outlet station.

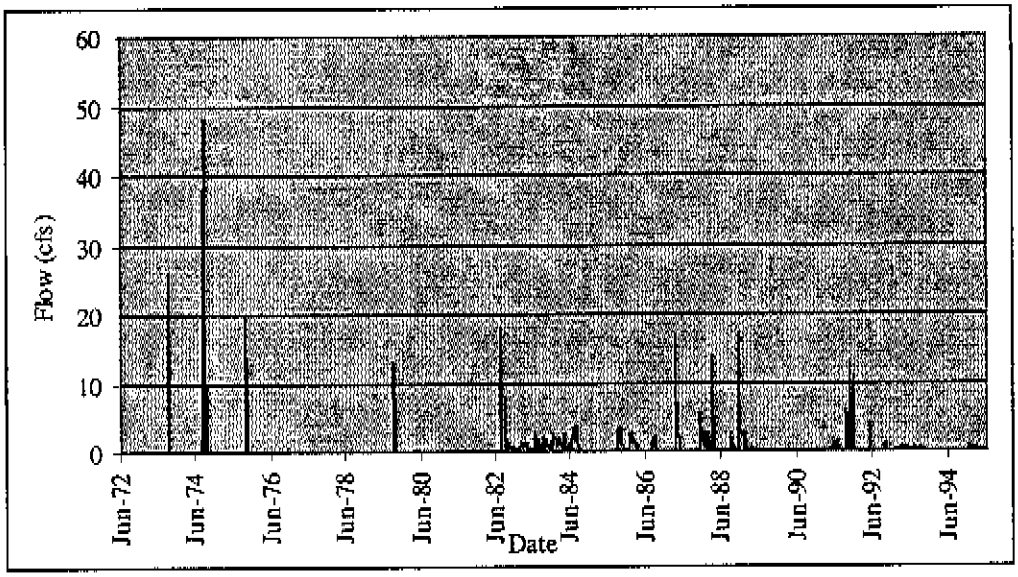

Figure 4a. Preferred flow data at South Lake outlet station.

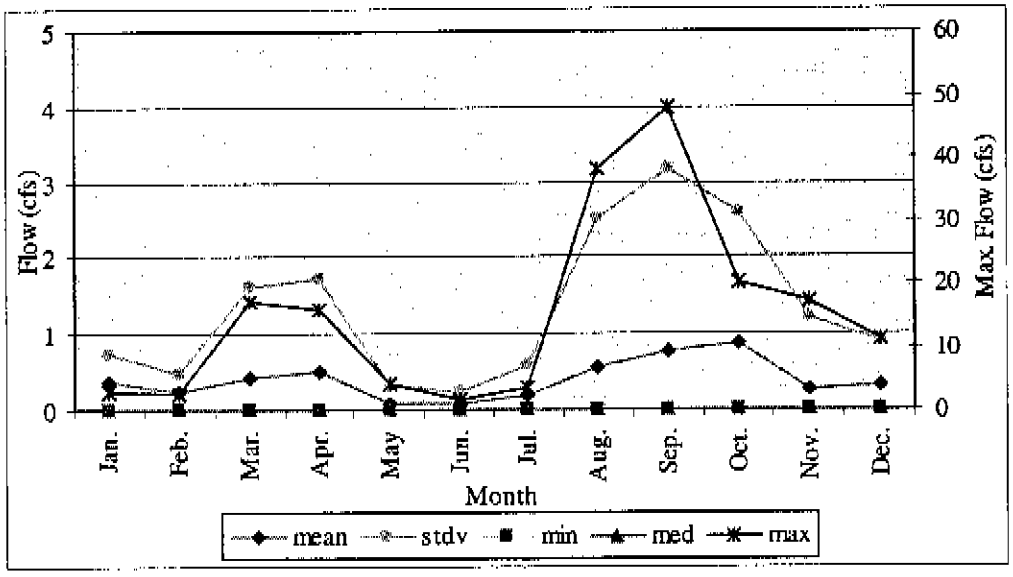

Figure 4b. Flow monthly statistics at South Lake outlet station.

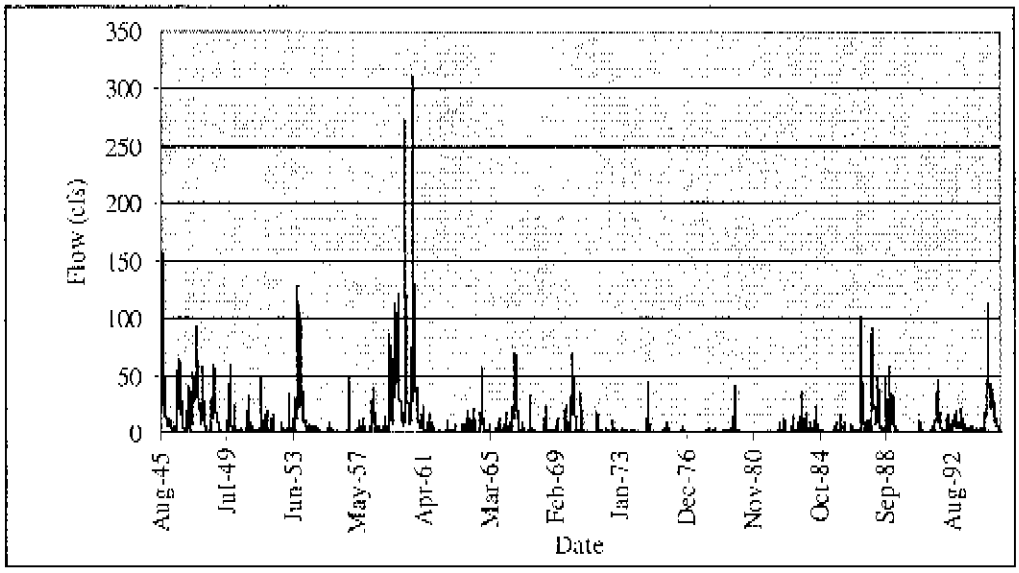

Figure 5a. Preferred flow data at Cypress Creek, Vineland station.

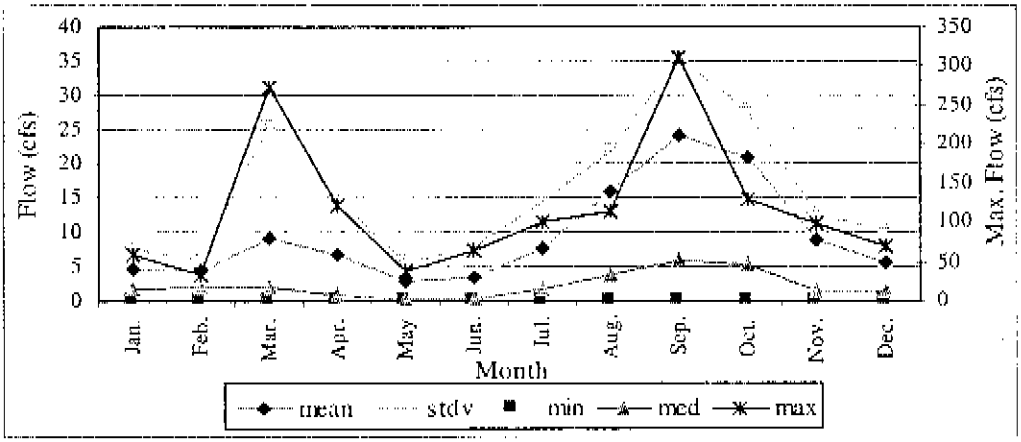

Figure 5b. Pre-67 flow monthly statistics at Cypress Creek, Vineland station.

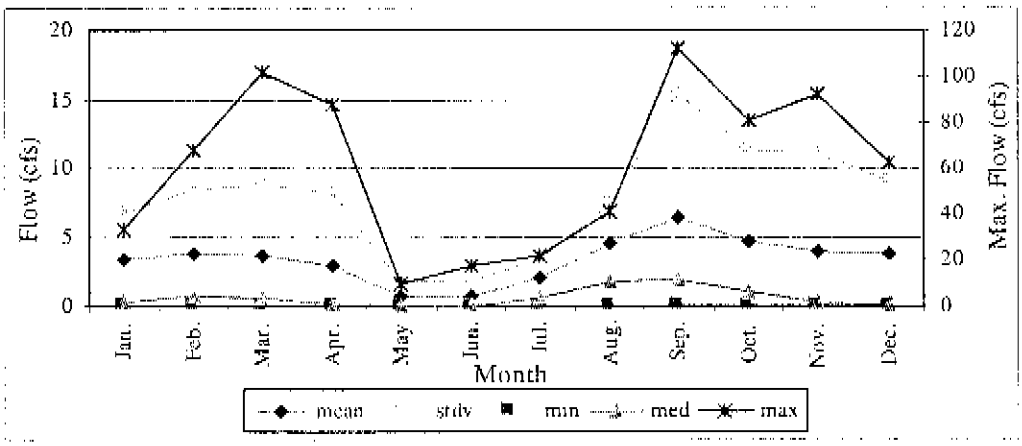

Figure 5c. Post-67 flow monthly statistics at Cypress Creek, Vineland station.

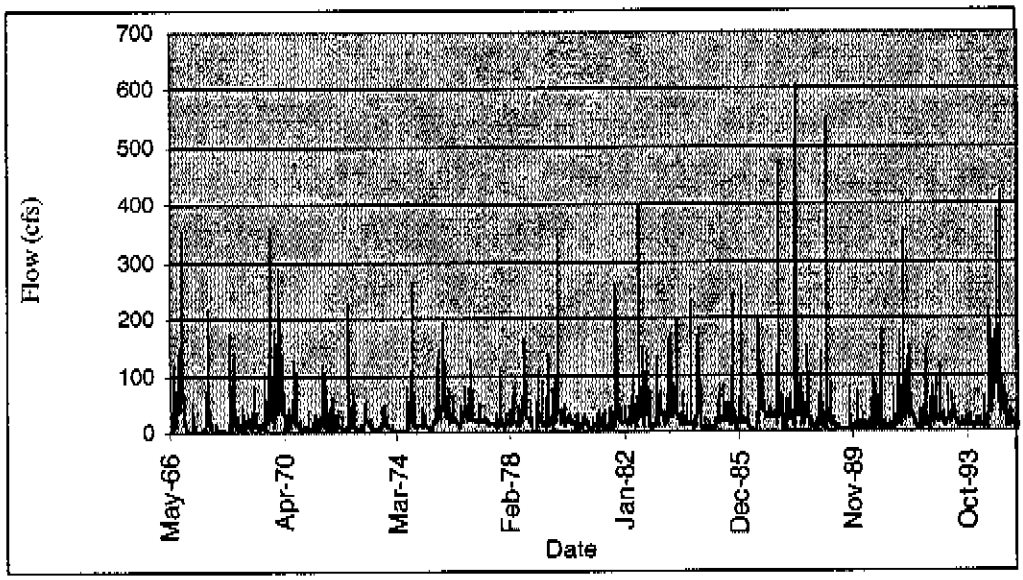

Figure 6a. Preferred flow data at Bonnet Creek, Vineland station.

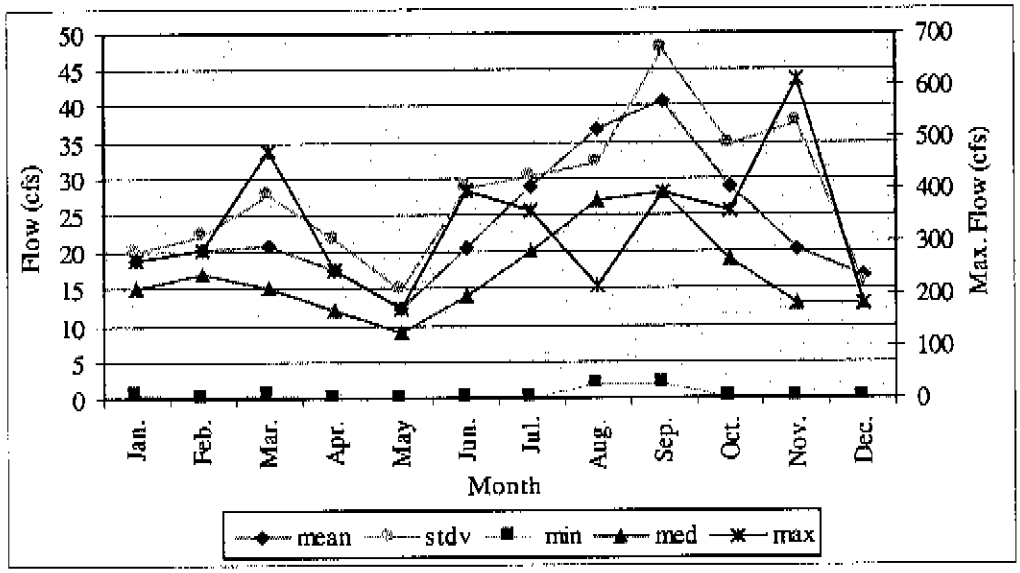

Figure 6b. Flow monthly statistics at Bonnet Creek, Vineland station.

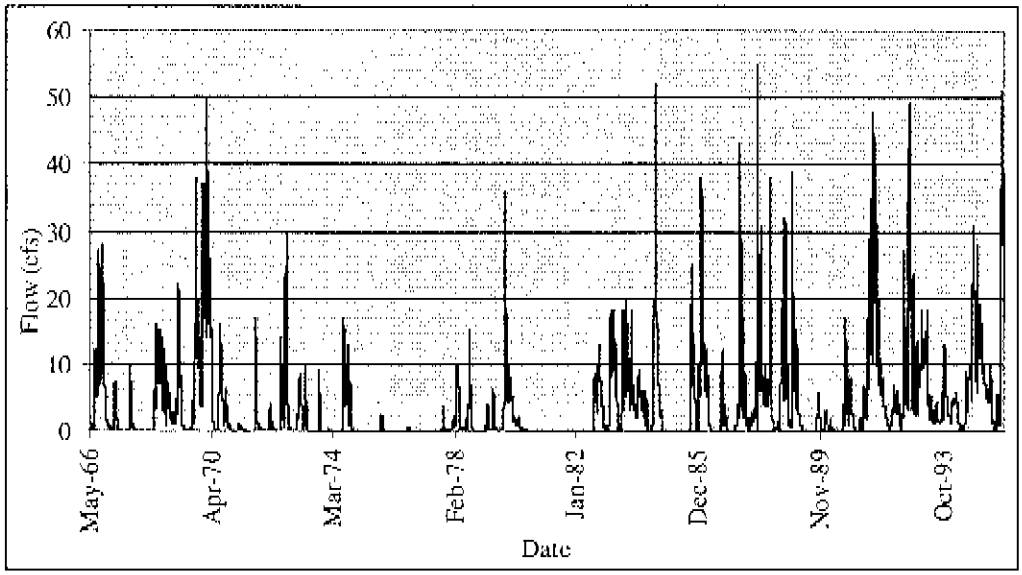

Figure 7a. Preferred flow data at Whittenhorse Creek, Vineland station.

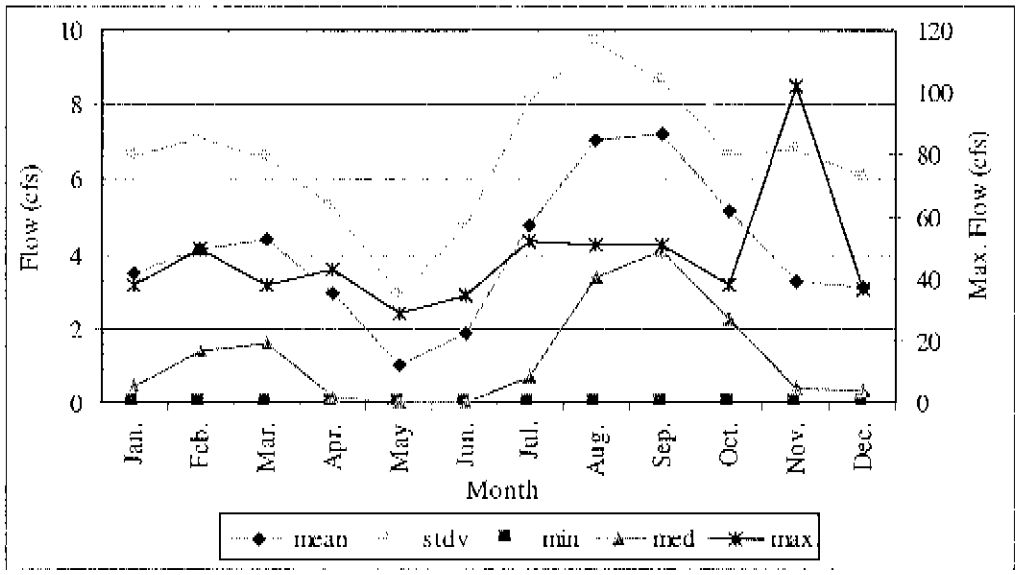

Figure 7b. Flow monthly statistics at Whittenhorse, Vineland station.

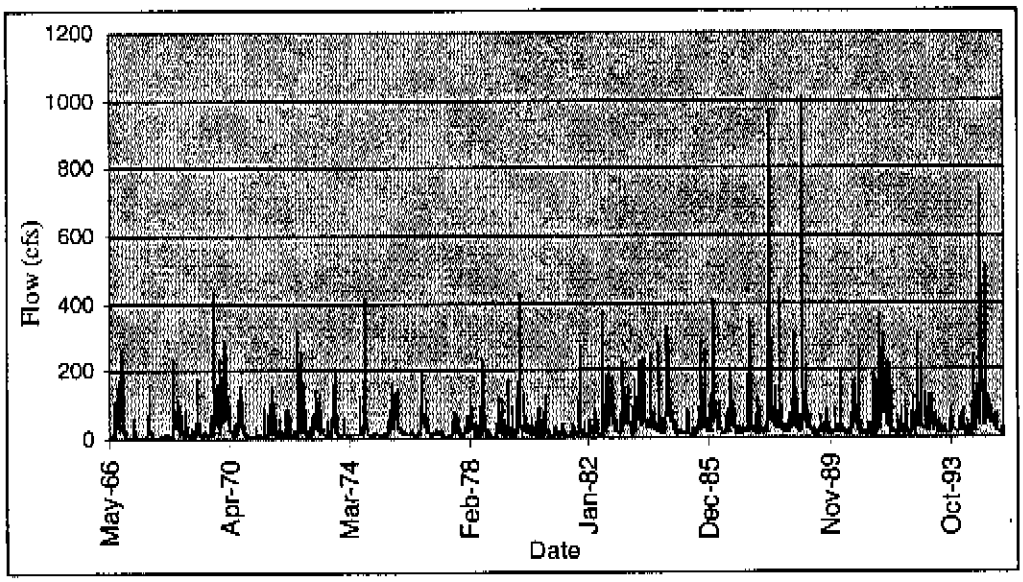

Figure 8a. Preferred flow data at Reedy Creek, Vineland station.

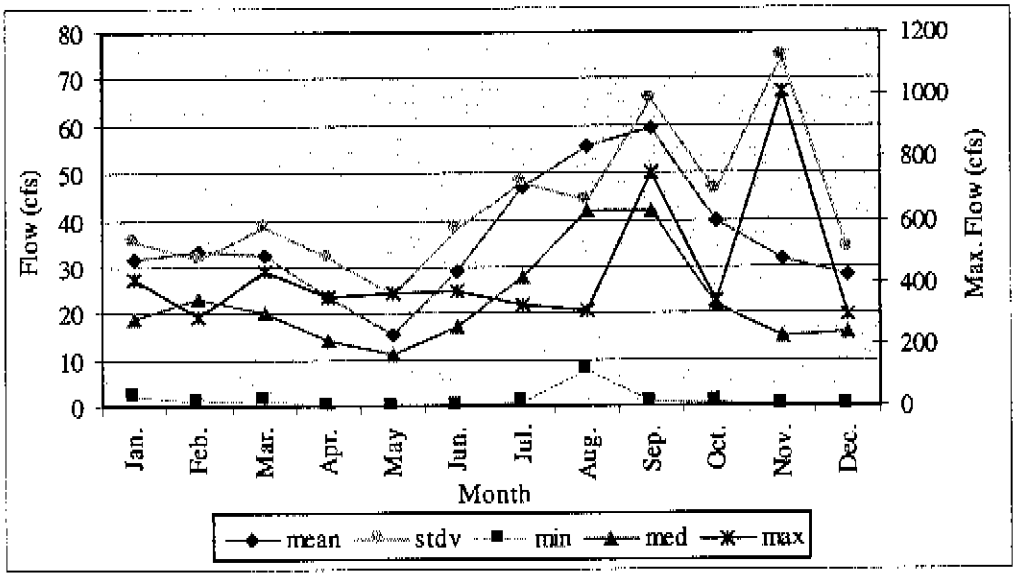

Figure 8b. Flow monthly statistics at Reedy Creek, Vineland station.

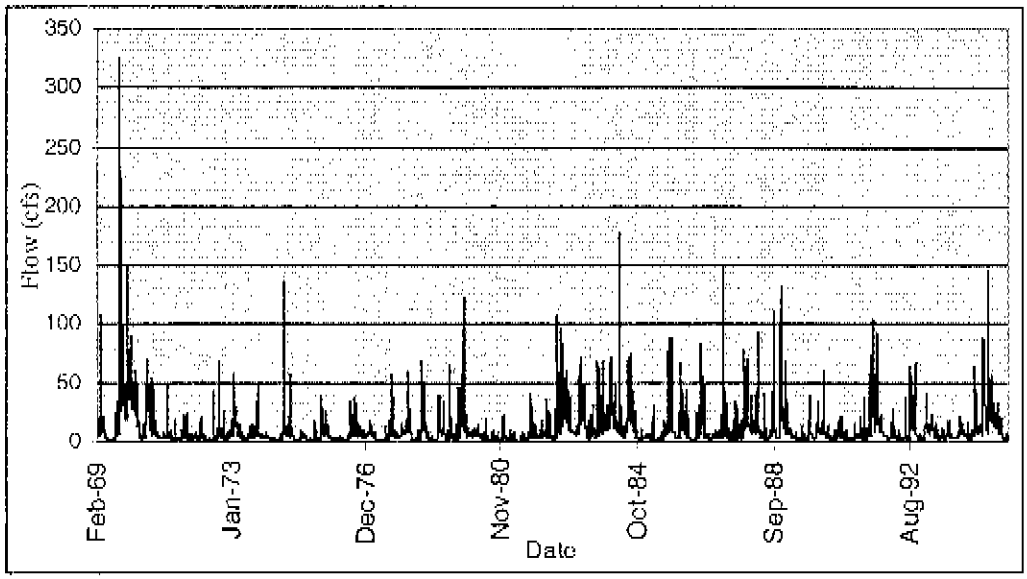

Figure 9a. Preferred flow data at Davenport, Loughman station.

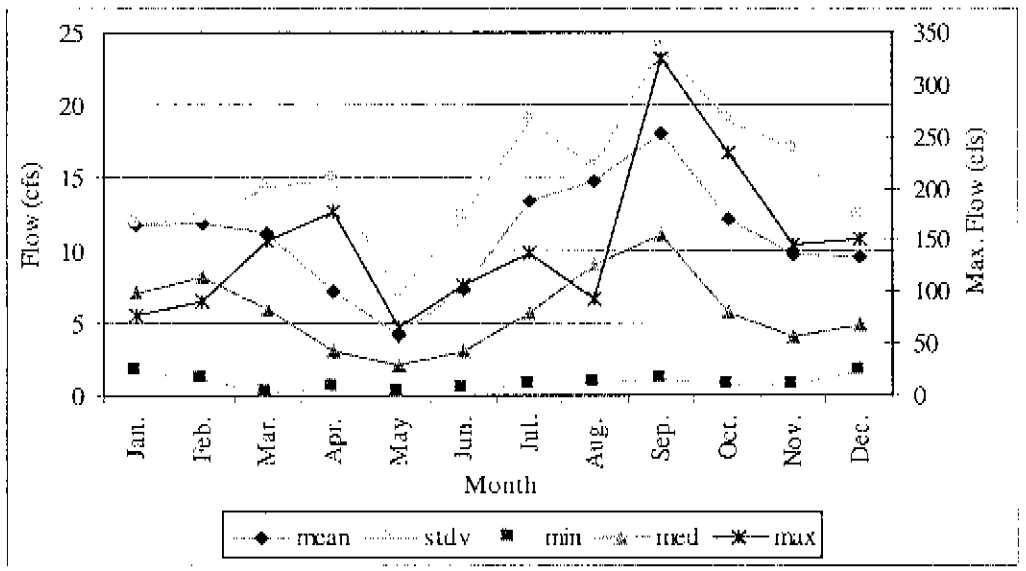

Figure 9b. Flow monthly statistics at Davenport, Loughman station.

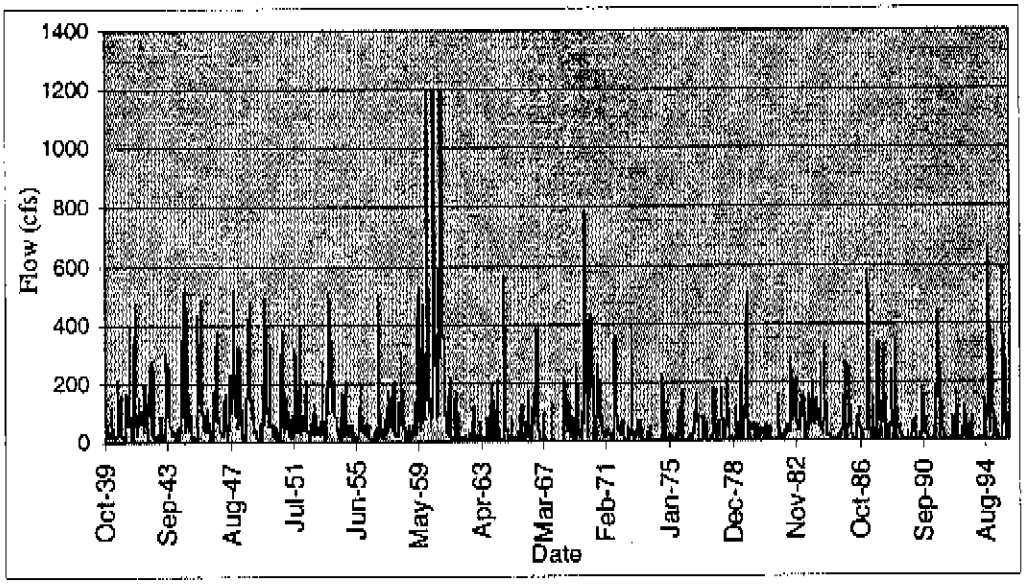

Figure 10a. Preferred flow data at Reedy Creek, Loughman station.

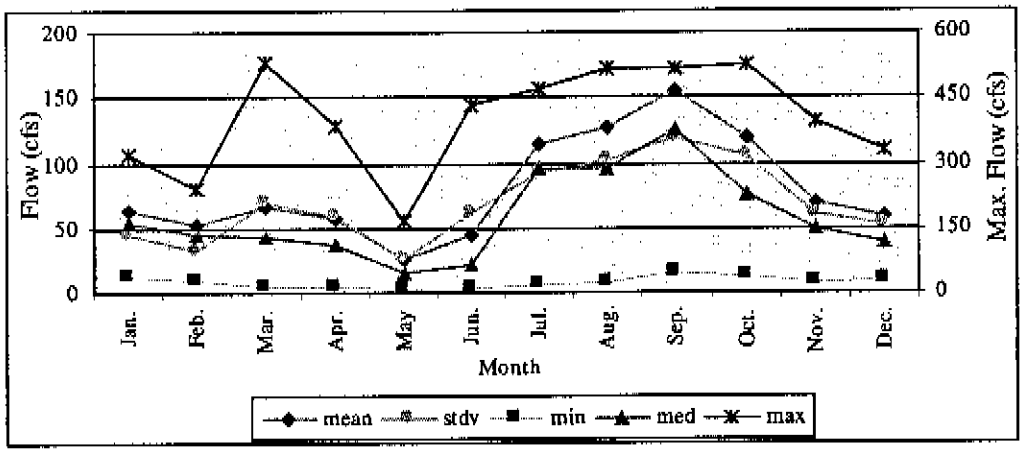

Figure 10b. Pre-67 flow monthly statistics at Reedy Creek, Loughman station.

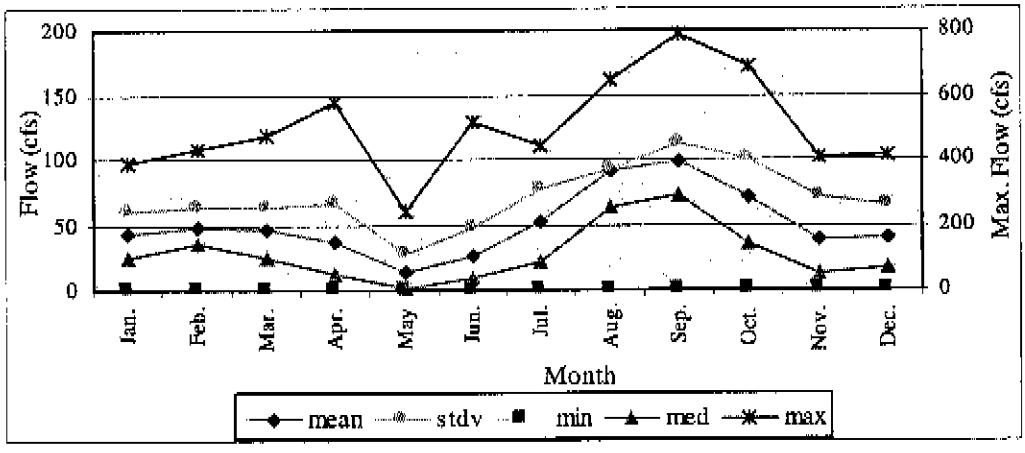

Figure 10c. Post-67 flow monthly statistics at Reedy Creek, Loughman station.

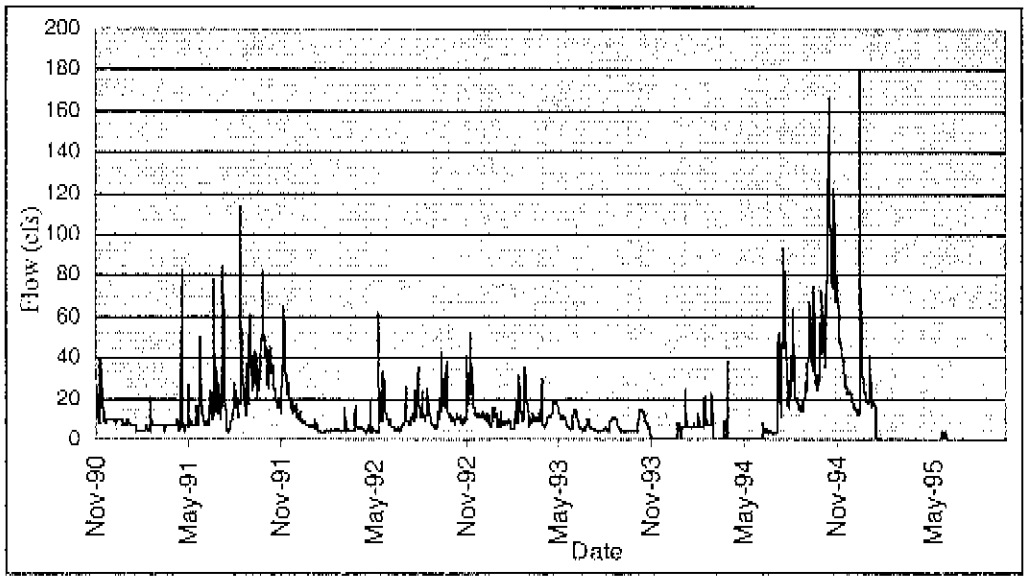

Figure 11a. Preferred flow data at Lateral 101 at S101 station.

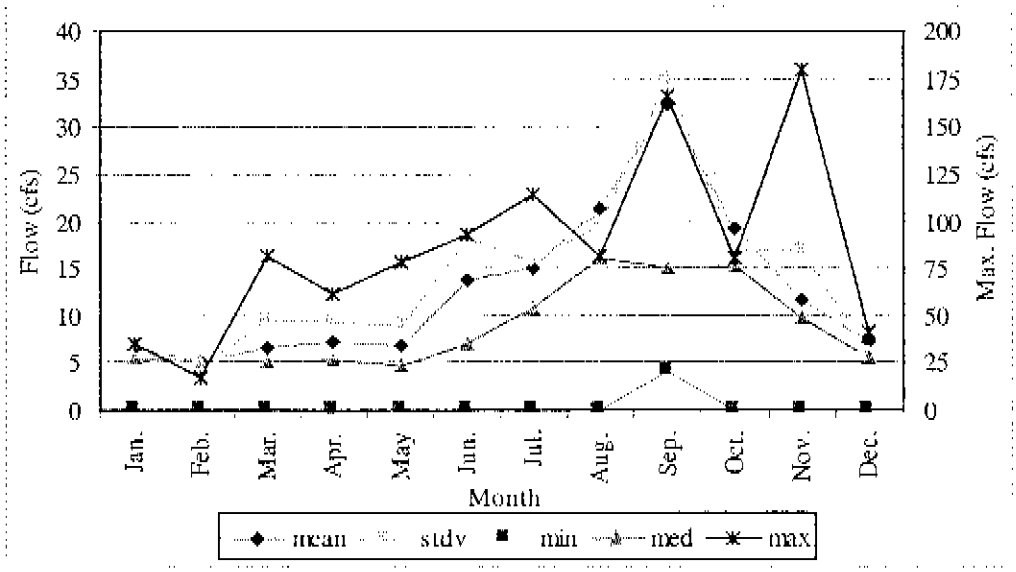

Figure 11b. Flow monthly statistics at Lateral 101 at S101 station.

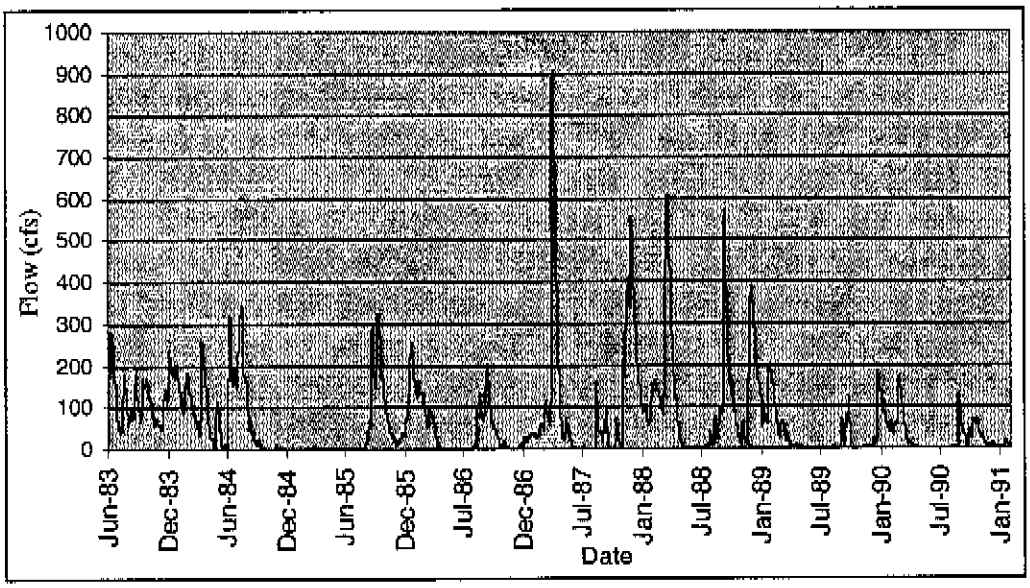

Figure 12a. Flow data at Reedy Creek, Florida Highway station.

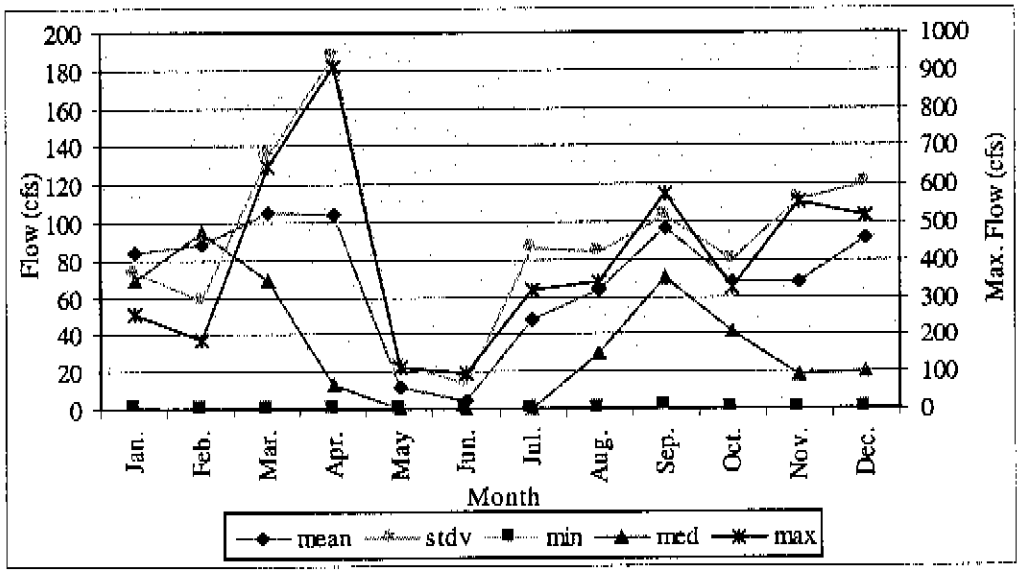

Figure 12b. Flow monthly statistics at Reedy Creek, Florida Highway station.

Post-67 flow monthly means for all stations are presented in Figure 13. The flow relative magnitudes are consistent with the flow routing discussed earlier. However, it is noticed that the outflow at RC Florida Highway station (downstream) is lower than the upstream flow at R.C Loughman station during the May-August period and much higher in the January-April period. This questionable data were not used to estimate any data at the other stations.

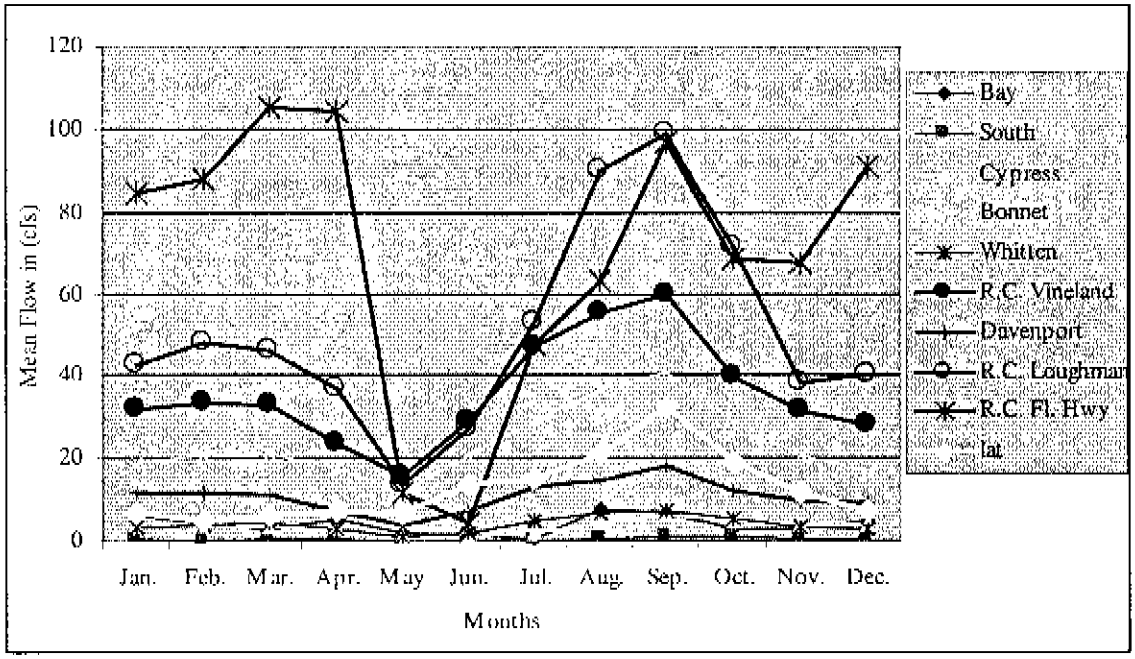

Figure 13. Monthly means for all available flow stations within the RCB.

RAINFALL

In this section, the objective is to provide a data summary for the historical rainfall average over the basin. While a weighted-average is desired using the Theissen polygon method, this presentation will be limited to an arithmetic average of the data. An estimation of the weighted average is deferred to another study. The available data and the data summary for rainfall are provided below.

Available Data

Figure 14 presents the spatial locations for nine rainfall stations within the RCB. Details about these stations are found in Table 3. The period of record for one data set is from 1916 to 1983. The period of records for the remaining data sets cover the period from 1965 to 1998. Time series for these records are presented in Appendix A.

Data Summary

For each station, the monthly rainfall data and the associated statistics are summarized in two tables presented in Appendix B. The procedures used for compiling these records are similar to those used for the Lake Kissimmee Basin (Ali, 1998).

Monthly rainfall data within the period 1965-1998 were used to compute an arithmetic monthly time series averaged across the entire basin. The associated statistics (e.g. mean, median, standard deviation, and maximum) are presented in Figures 15a, b, c, and d. Figure 15a shows the monthly average over the period of record. The figures clearly reflect dry conditions during the period October to April (less than 3-inch monthly rainfall) and wet conditions during the period May to September (more than 4-inch monthly rainfall). Also, the mean and the median are very close reflecting symmetry in the data distribution. The monthly time series was summarized into annual time series representing the entire basin (Figure 16). From this figure, it is observed that rainfall for years 1984 and 1988 was below 40 inches; and rainfall for year 1969 was above 60 inches. The annual areal rainfall average is 46.2 inches with an annual standard deviation of 7.8 inches.

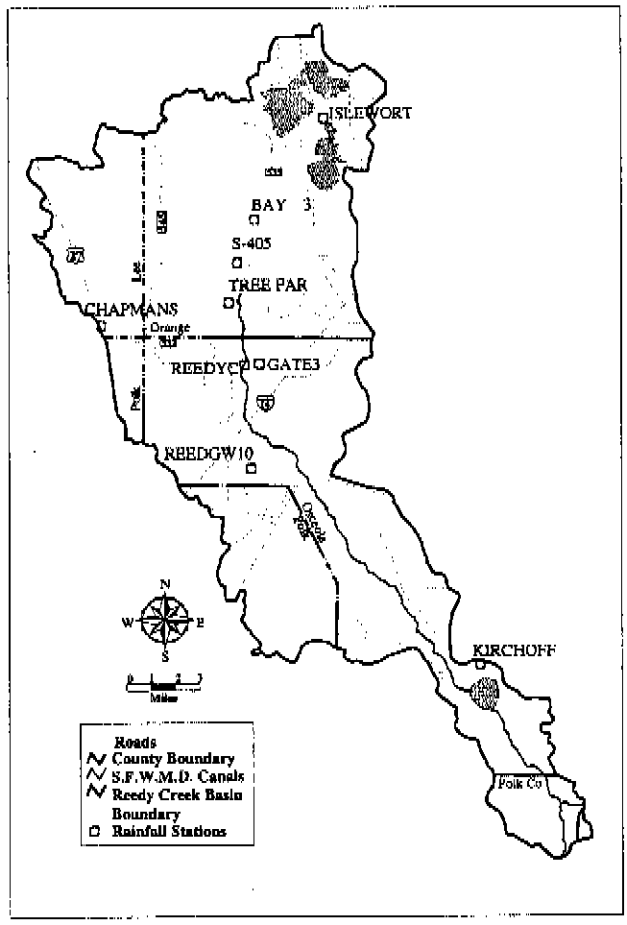

Figure 14. Rainfall stations within the RCB.

Table 3. Information about stations with rainfall records within the RCB.

Station	Dbkey	Method	Starting Date	Ending Date	Latitude	Longitude
REEDYC_R	00153	Sum	1977	1992	813448	281957
GATE3_R	03547	Sum	1974	1984	813412	281959
TREE FAR_R	03553	Sum	1974	1987	813527	282212
S-405_R	03554	Sum	1974	1987	813507	282339
BAY	03562	Sum	1974	1987	813425	282513
REEDGW10_R	05790	Sum	1968	1998	813431	281614
KIRCHOFF_R	05862	Sum	1969	1998	812510	280908
ISLEWORT_R	06144	Sum	1916	1983	813136	282853
CHAPMANS_R	06228	Sum	1965	1977	814039	282121

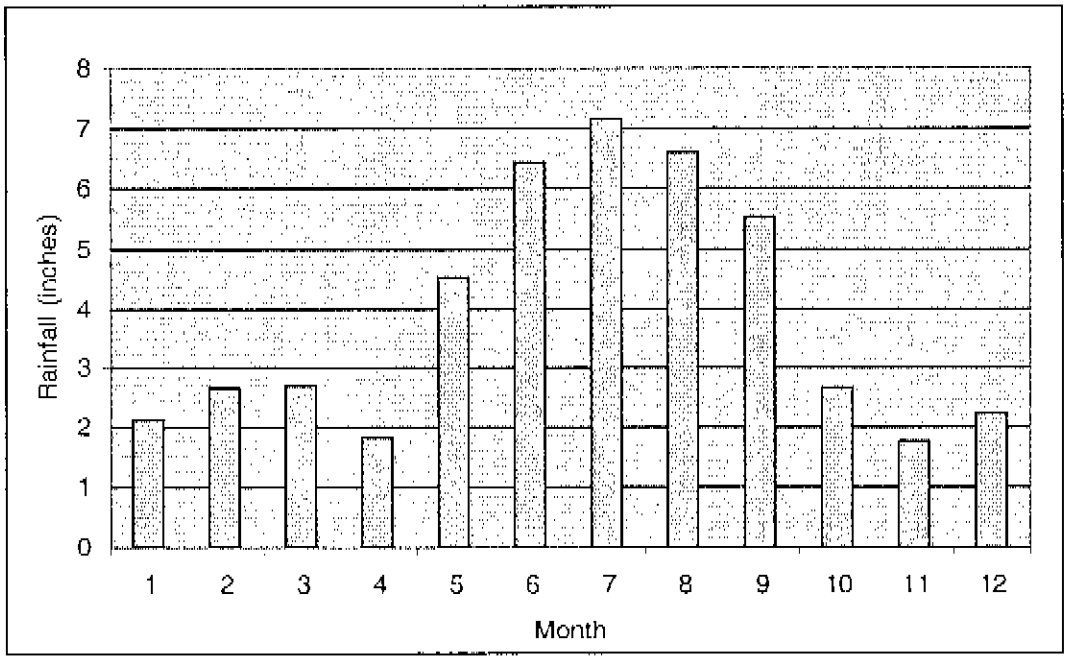

Figure 15a. Monthly mean of areal rainfall over the RCB.

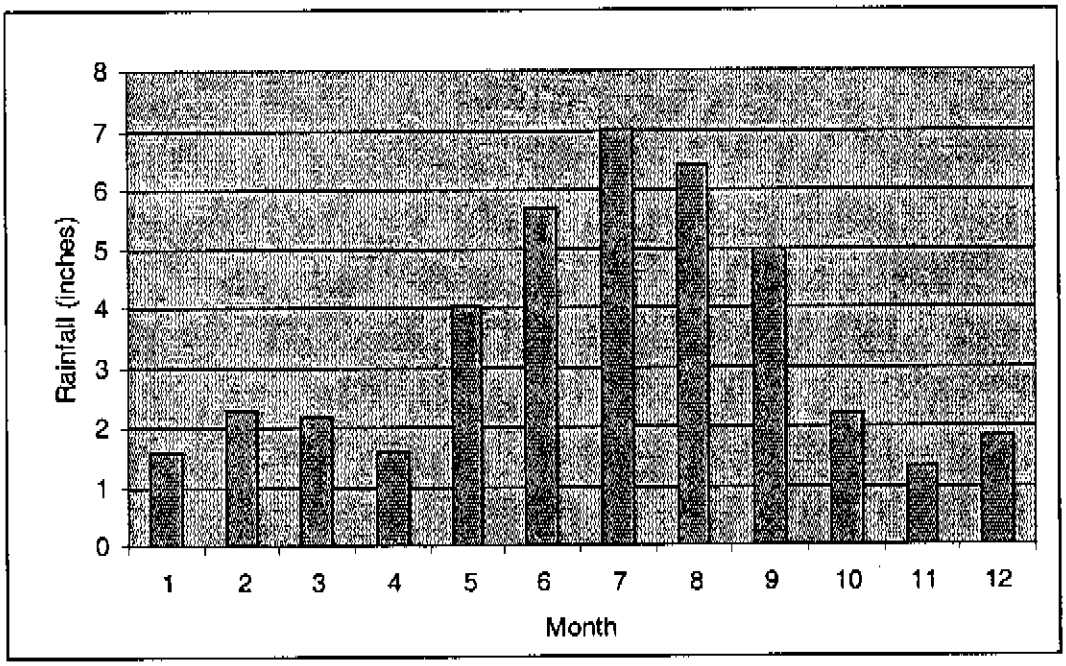

Figure 15b. Monthly median of areal rainfall over the RCB.

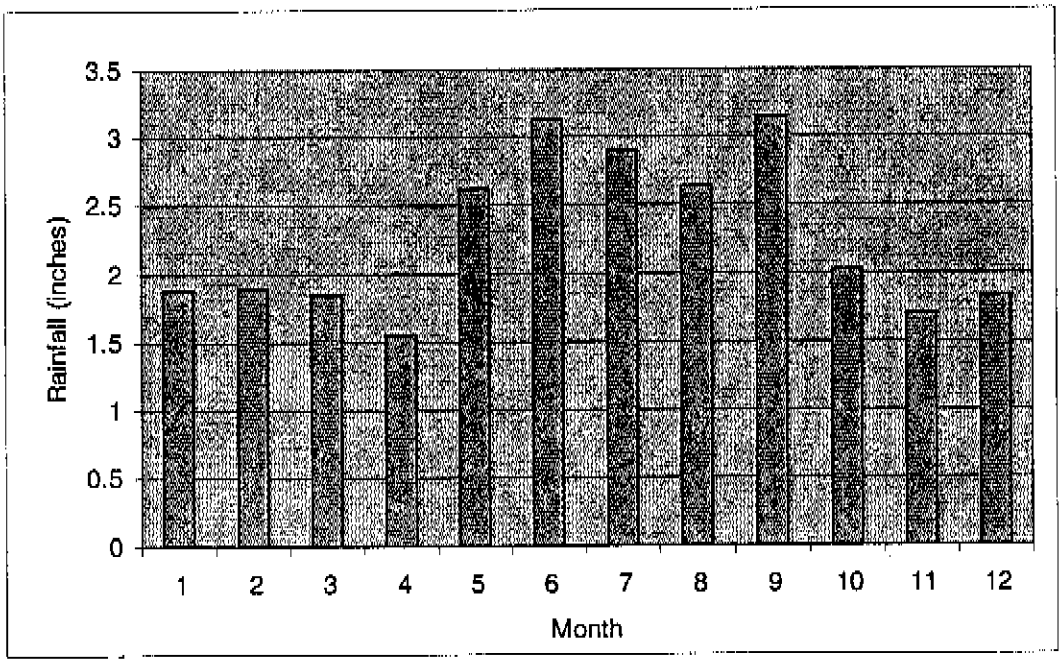

Figure 15c. Monthly standard deviation of areal rainfall over the RCB.

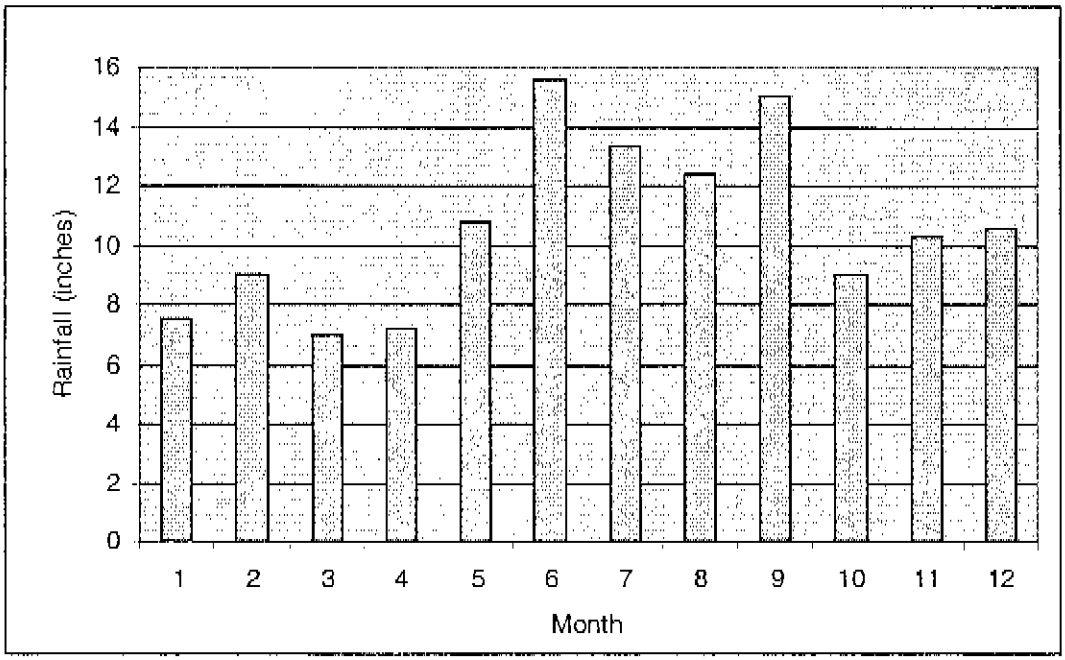

Figure 15d. Monthly maximum of areal rainfall over the RCB.

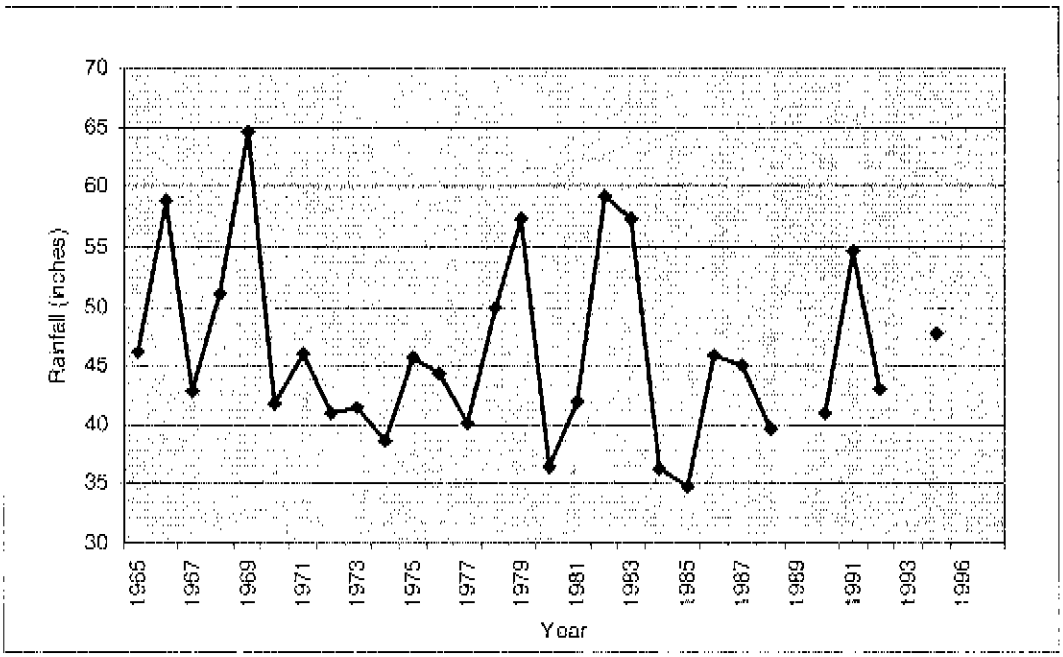

Figure 16. Historical annual rainfall averaged across the RCB.

STAGE

Stage stations were found in numerous lakes and creeks within the RCB. The hydrologic relationship between these stations is not clear. Therefore, it is difficult to use stage at a given location to predict the stage at another location. A presentation of the available data is provided below followed by a hydrologic summary of these data.

Available Data

Twenty-one stations with daily mean stage records are available in the RCB. Information about these stations is provided in Table 4, and their spatial locations are presented in Figure 17. A lot of missing and questionable data records were found at four other stations (Lake Trout, Lateral 101, and two stations along Cypress Creek), which were not included in the data summary.

Table 4. Information about stations with reliable stage records within the RCB.

Station	Dbkey	Method	Starting year	Ending year	Latitude	Longitude	Cluster number
BAY	00119	Daily Mean	1967	1988	282408	813328	1
L MABLE	00121	Daily Mean	1969	1971	282511	813258	2
SOUTH L.	00122	Daily Mean	1969	1995	282445	813217	2
L BUTLER	00124	Daily Mean	1933	1978	282926	813204	3
BONNET C	00129	Daily Mean	1969	1995	281958	813120	4
WHITTEN	00139	Daily Mean	1933	1995	282305	813700	5
REEDYC	00154	Daily Mean	1969	1995	281957	813448	6
DAVENPORT	00160	Daily Mean	1969	1995	281615	813528	7
REEDYLOU	00163	Daily Mean	1933	1995	281548	813212	8
REEDC	05146	Daily Mean	1983	1998	280858	812628	9
REEDYC 5_H	05590	Daily Mean	1984	1984	281631	813239	10
REEDYC 5_T	05592	Daily Mean	1984	1984	281631	813239	11
SOUTH L2	05659	Daily Mean	1971	1982	282445	813217	12
REEDYC 5_T	05688	Daily Mean	1986	1995	281631	813239	11
REEDYC 5_H	07478	Daily Mean	1986	1995	281631	813239	10
WR6	FF825	Daily Mean	1997	1997	280649	812446	13
WR8	FF827	Daily Mean	1997	1997	280620	812503	13
WR9	FF829	Daily Mean	1997	1997	280631	812510	13
WR11	FF831	Daily Mean	1997	1997	280500	812417	13
WR15	FF833	Daily Mean	1997	1997	280455	812325	13
WR16	FF835	Daily Mean	1997	1997	280439	812333	13

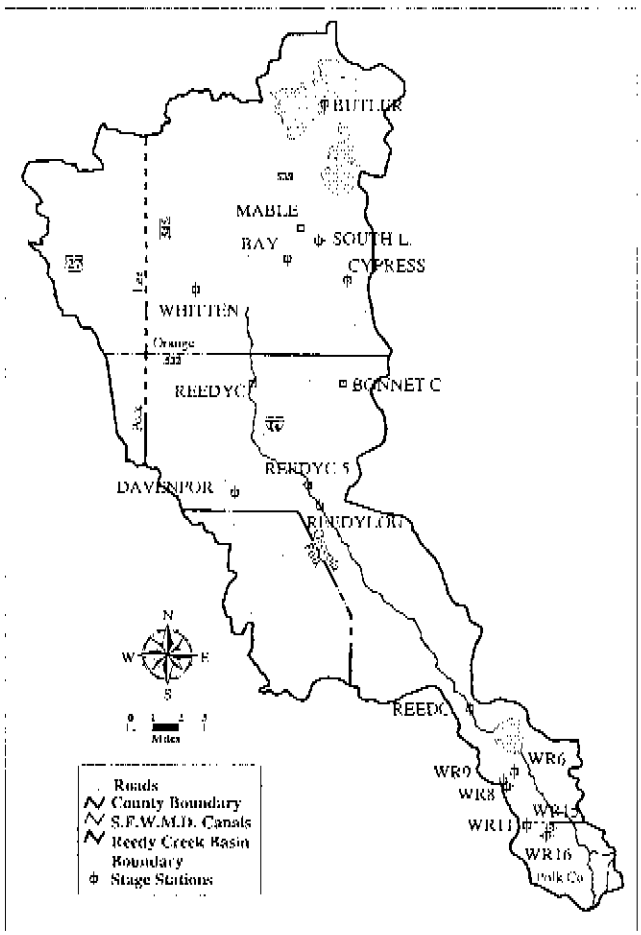

Figure 17. Stage stations within the RCB

Data Summary

The hydrologic relationship among the water bodies (creeks and lakes) within the RCB is not clearly defined. Therefore, stage data were not averaged across stations within a given locality. The stage data are, instead, presented independently in single figures, or in multi-plot figures if more than one station exists at a given locality. In the latter situation, the associated statistics are only lumped if the time series plots do not show significant difference across such stations. The 21 stations available for this study are grouped into the following 13 clusters (Table 4). L. Bay, L. Mable & South (NR), L. Butler, Bonnet C., Whitten C., Reedy C., Vine, Davenport, ReedyLou, ReedyHwy, South L. (NE), Reedy_H, RCDD, Reedy_T, RCDD, and W.R. Sites.

The time series and the associated statistics for these groups are presented in Appendix C. Figure 18 shows monthly average stages for the groups. The legend in this figure is arranged in descending stages within these groups. It is noticed that the stage

decreases southward. It is also noticed that the stage average values are consistent with the flow routing scenario presented earlier.

EVAPORATION

Pan evaporation daily measurements are available at Bay Lake station from year 1974 to year 1984. These data were used to compute monthly sum of pan evaporation. Gaps with missing data for up to seven days were filled using linear interpolation. Gaps with longer periods of missing record were dropped. A monthly sum within such periods is estimated as the average monthly sum based on the available data. Figure 19 shows the annual pan evaporation data. The mean annual value is approximately 46.5 inches. This value is close to the annual evaporation estimate for the area (Wylen and Zorn, 1998). It is half inch less than the annual evaporation estimate for Lake Alfred (Ali, 1998). This result is consistent with the hydrometeorological characteristics of South Florida. Figure 20 shows the monthly statistics.

SUMMARY

Data summaries and preferred key development for the hydrologic data pertaining to the RCB were presented. The hydrologic components of interest were Flow, Rainfall, Stage, and Evaporation. Statistical approaches coupled with previous experience and hydrologic concepts were effective tools in this study. In this study, the flow route within the water bodies in the RCB along with correlation were used to estimate missing and "questionable" flow data within the RCB. Monthly rainfall data were summarized in tables for the entire period of record at all stations. Statistics for the RC Florida Highway station data shows that these data need more investigations before a serious QA\QC can be performed. Rainfall annual averages and monthly statistics were presented. Average stages for all water bodies within the RCB were presented and summarized into monthly statistics. Pan evaporation data is also presented. In general, there is agreement between the monthly average stage at the lakes and creeks and the general flow direction.

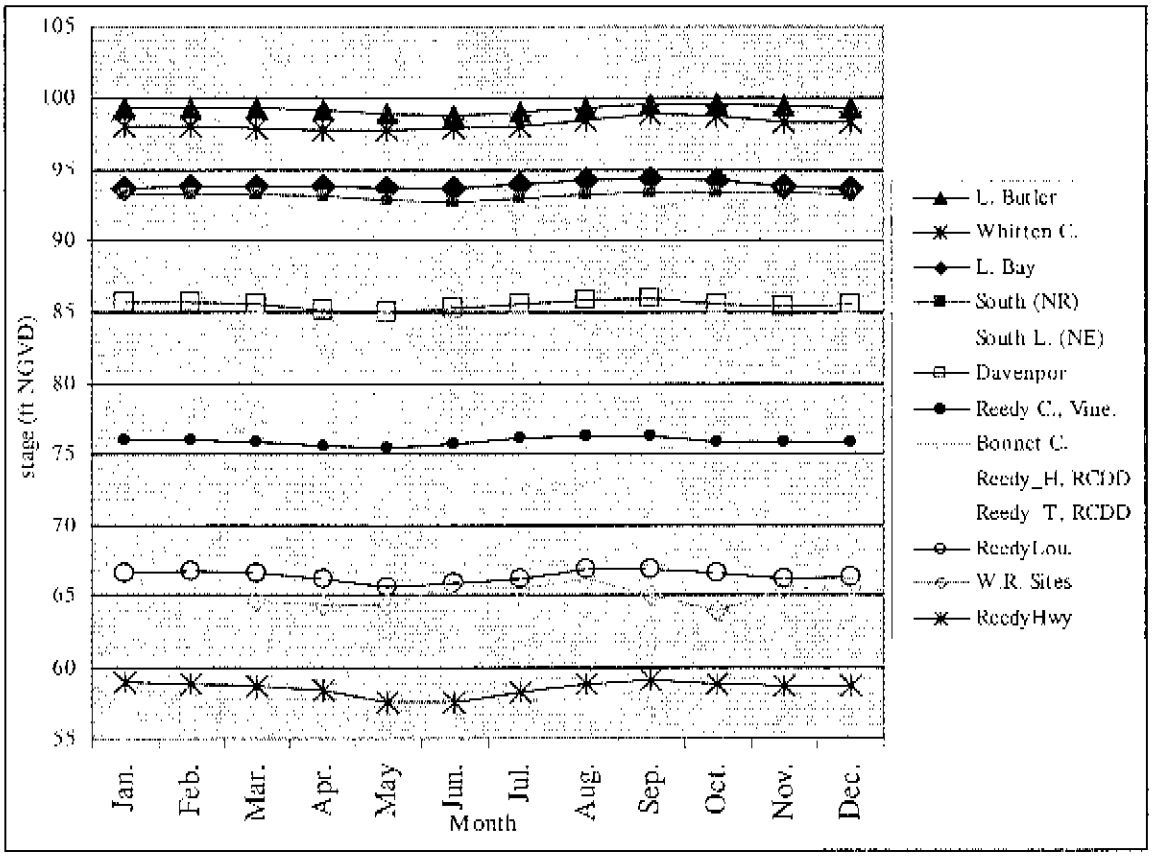

Figure 18. Monthly average stage at 13 sites based on records at 21 stations.

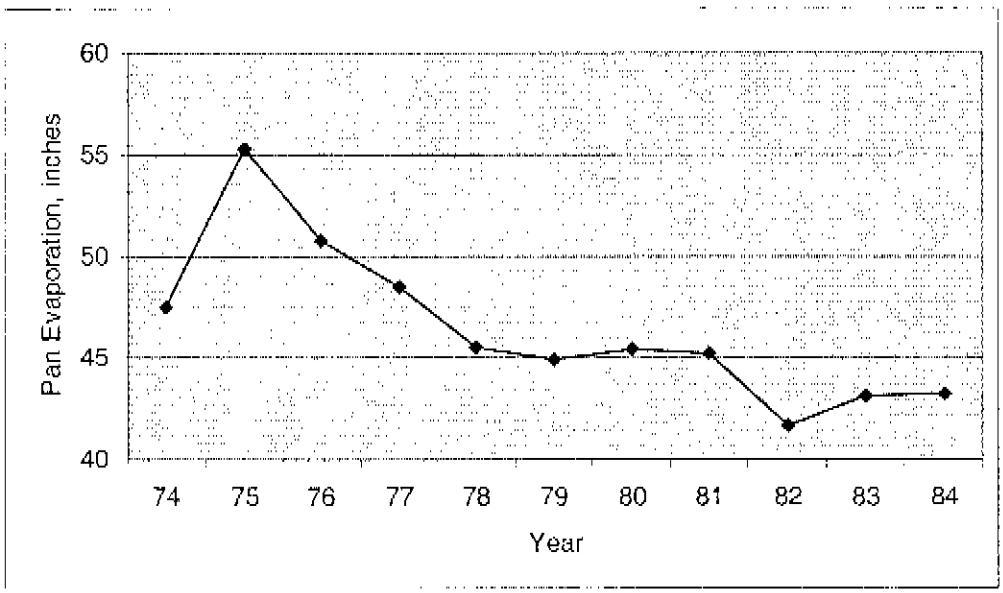

Figure 19. Annual pan evaporation at Lake Bay.

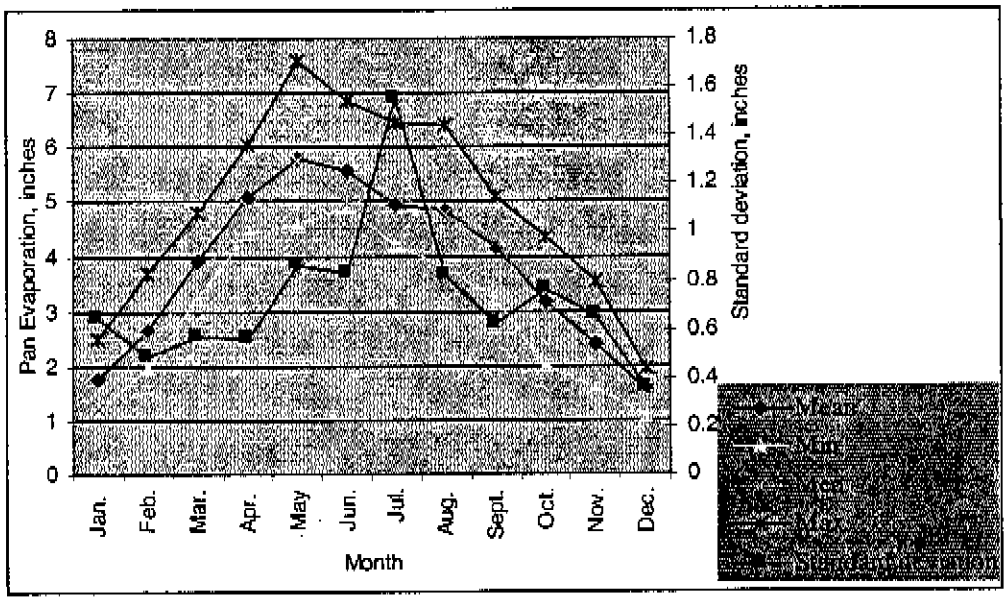

Figure 20. Monthly statistics for estimated pan evaporation at Lake Bay.

REFERENCES

Ali, A. 1998. Hydrologic Report of Lake Kissimmee Basin and Preferred Database Development. Technical Memorandum WRE 361, South Florida Water Management District, West Palm Beach, Florida.

Guardo, M. 1992. An Atlas of the Upper Kissimmee Surface Water Management Basins. Technical Memorandum, Water Resources Engineering Division, Department of Research and Evaluation, South Florida Water Management District, West Palm Beach Florida.

U.S. Geological Survey, Water-Resources Investigations Report 84-4250. 1986. Summary of Hydrologic Conditions in the Reedy Creek Improvement District, Central Florida. Prepared in Cooperation with the Reedy Creek Improvement District. Tallahassee, Florida.

Wylen, P. R. and M. R. Zorn. 1998. Prediction of Mean Annual Flows in North and Central Florida. Journal of Water Resources Association. Vol. 34, No. 1. pp. 149-157.

APPENDIX A

Charts for historical daily rainfall data

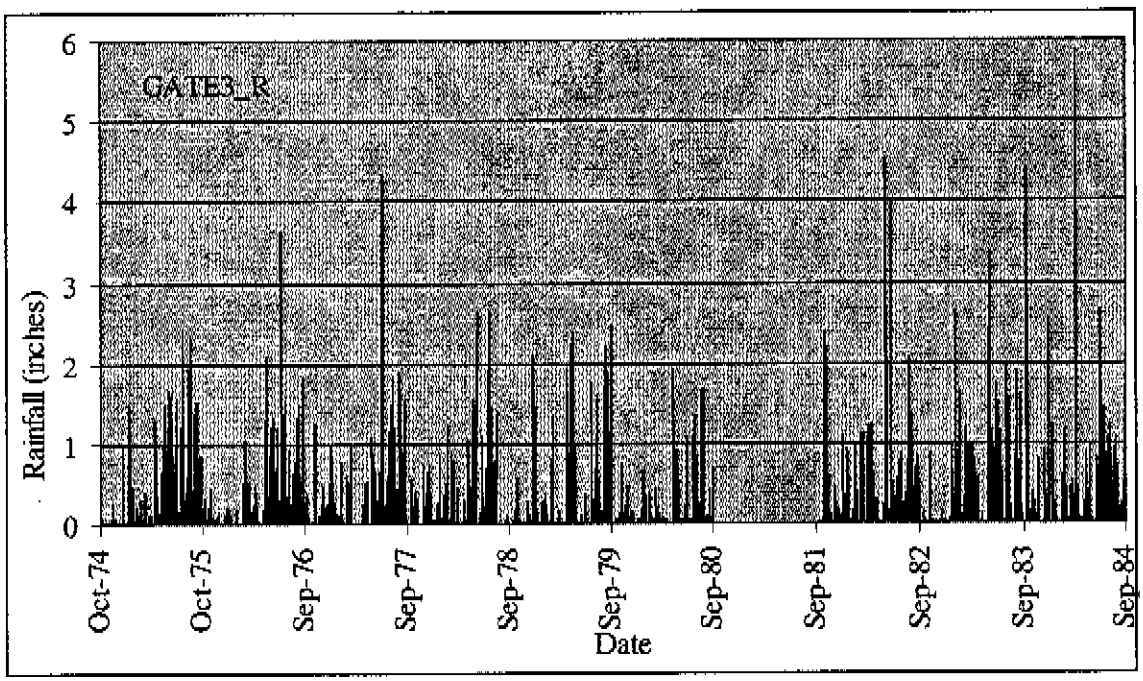

Figure A1. Historical daily rainfall data at station GATE3_R (few records are cumulative values of more than one day)

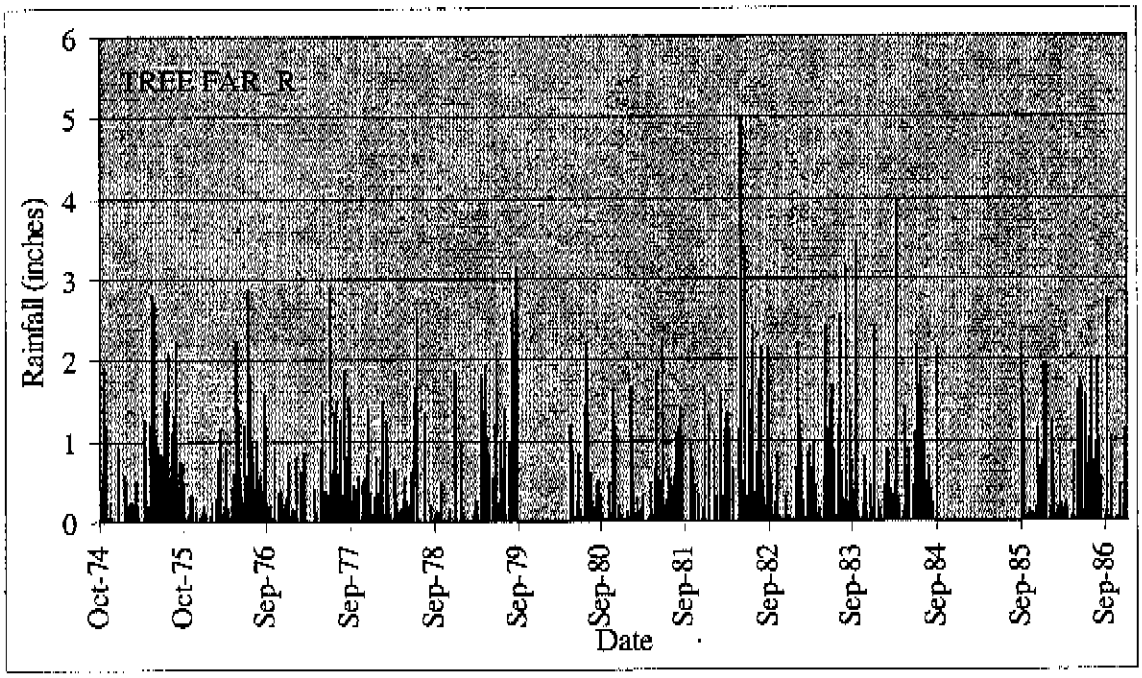

Figure A2. Historical daily rainfall data at station TREE FAR_R (few records are cumulative values of more than one day)

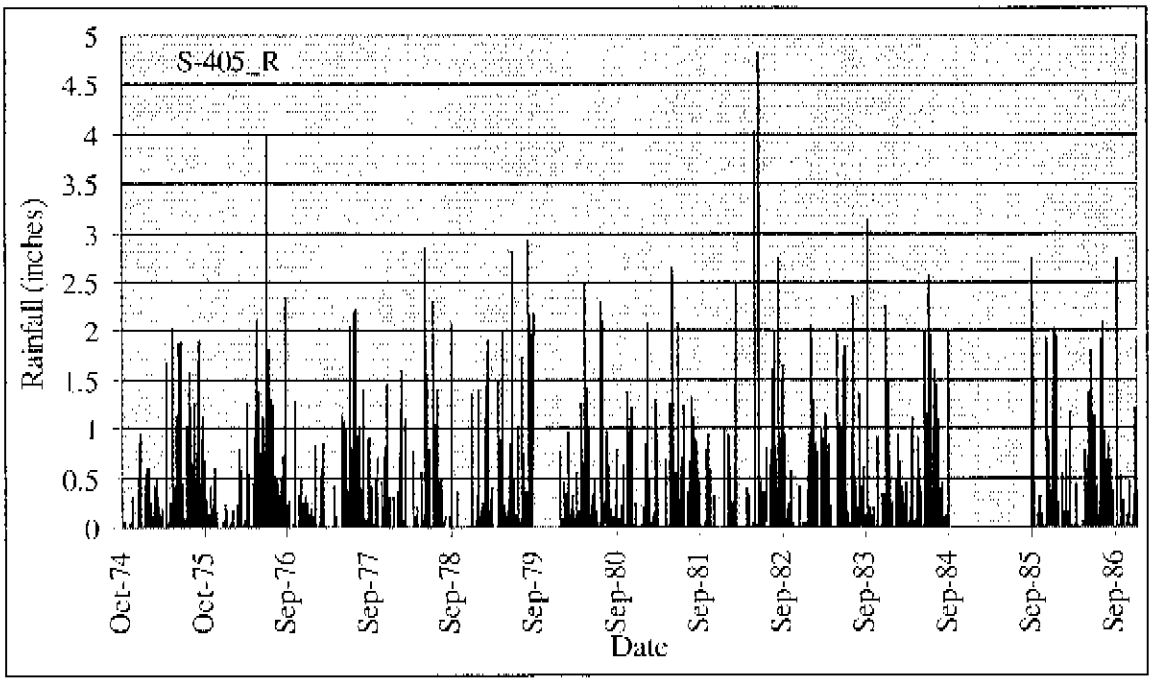

Figure A3. Historical daily rainfall data at station S-405_R (few records are cumulative values of more than one day)

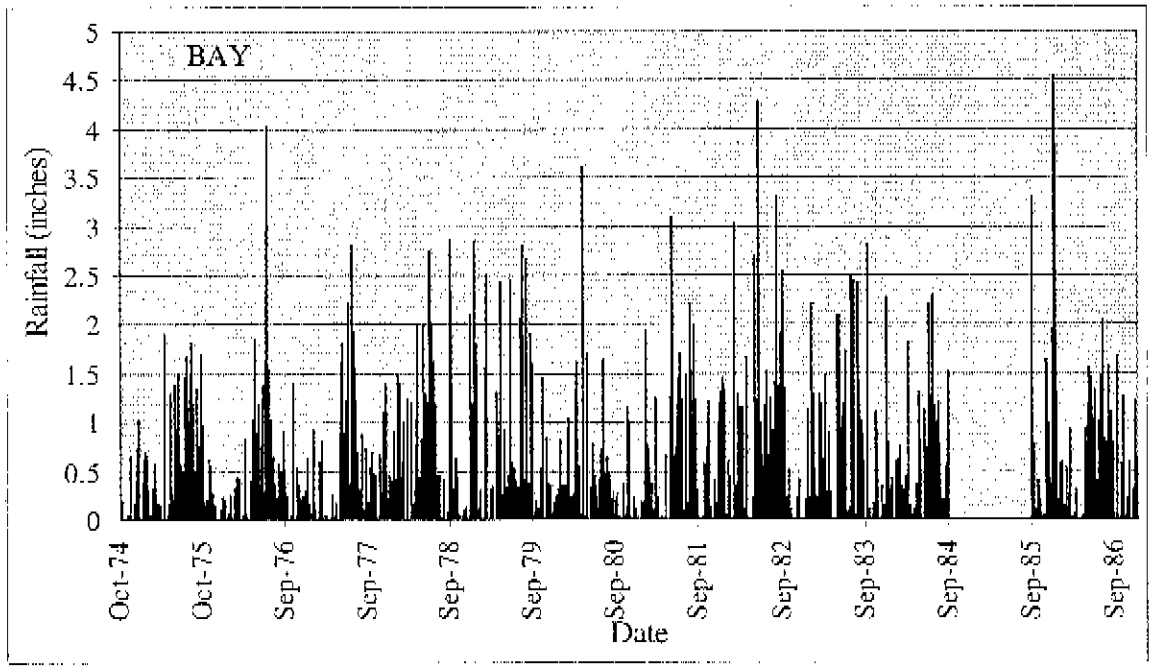

Figure A4. Historical daily rainfall data at station BAY (few records are cumulative values of more than one day)

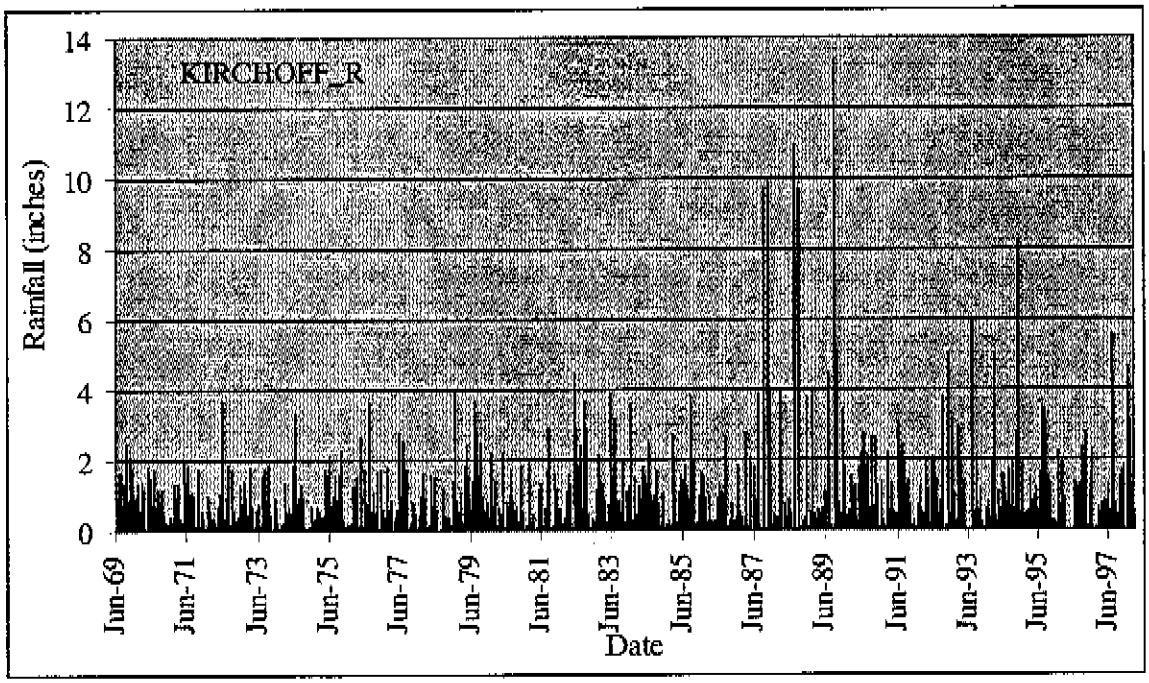

Figure A5. Historical daily rainfall data at station KIRCHOFF_R (few records are cumulative values of more than one day)

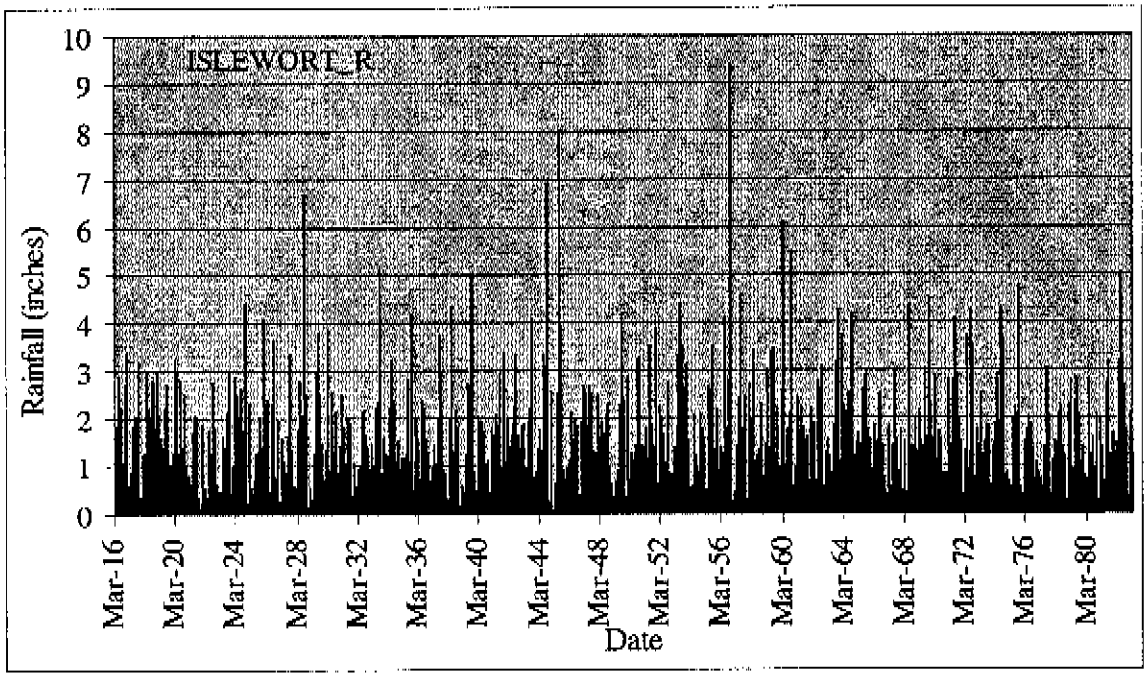

Figure A6. Historical daily rainfall data at station ISLEWORT_R (few records are cumulative values of more than one day).

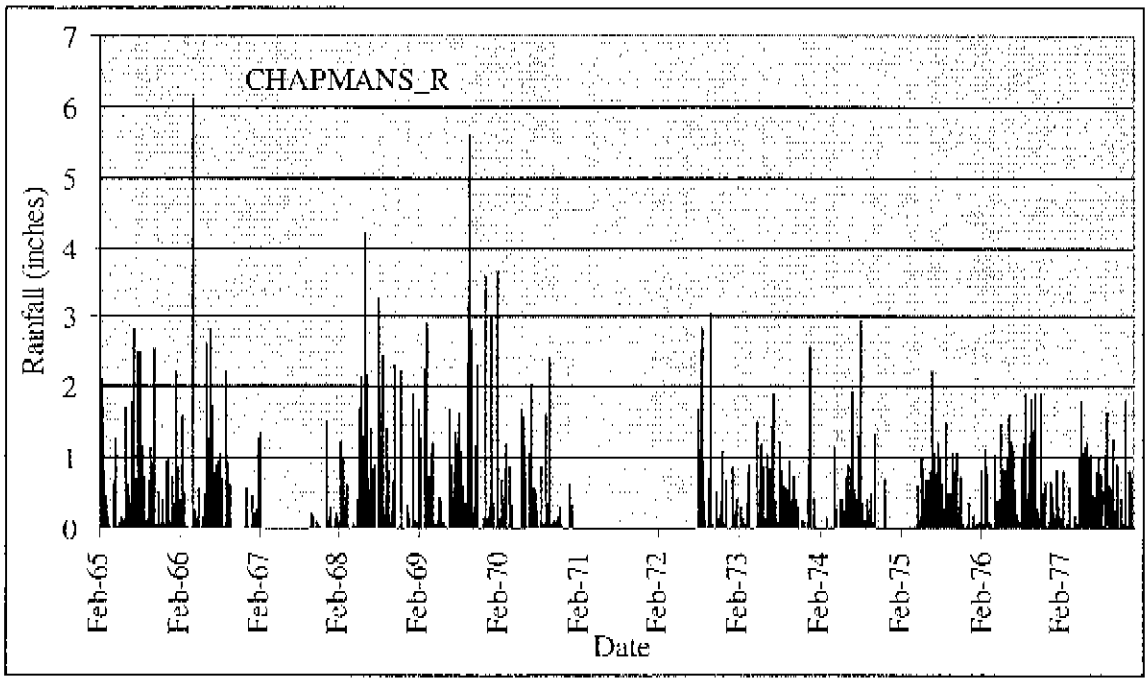

Figure A7. Historical daily rainfall data at station CHAPMANS_R (few records are cumulative values of more than one day).

APPENDIX B

Tables for monthly and annual rainfall statistics

Table B1_1. Monthly and Annual Sums for Station Gate3_R, dbkey 3547

year	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	SUM	
74	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.07	0.44	1.64	2.15	*
75	2.21	0.99	0.6	1.59	7.7	7.58	8.06	9.72	6.83	1.51	0.31	0.69	47.8	
76	0.23	0.88	2.72	1.29	6.69	5.22	9.91	4.34	9.29	0.5	2.06	2.95	46.1	
77	2.28	1.99	1.48	0.35	4.15	2.44	9.72	8.64	9.01	-----	2.05	2.95	45.1	*
78	-----	3.93	2.3	-----	4.5	-----	-----	-----	-----	-----	-----	4.78	15.5	*
79	-----	1.4	1.65	2.88	9.67	1.24	3.2	4.96	11.09	0.37	1.56	0.41	38.4	*
80	1.52	0.84	1.02	0.25	4.62	2.02	5.98	5.01	1.71	-----	-----	-----	23.0	*
81	-----	-----	-----	-----	-----	-----	-----	-----	-----	5.06	1.59	2.63	9.3	*
82	2.21	2.33	6.67	2.77	7.72	8.3	6.12	9.27	2.94	0.17	0.98	0.23	49.7	
83	1.74	8.12	6.12	2.25	3.5	10.59	5.65	8.86	7.32	6.83	1.62	4.8	67.4	
84	1.81	3.17	1.45	7.21	3.56	5.08	10.76	5.06	3.74	-----	-----	-----	41.8	*

* Partial: Annual sum based on cumulative rainfall in less than 12 months

Table B1_2. Statistics of the Monthly Sums for Station Gate3_R, dbkey 3547

#yrs	month	Mean	Var	Min	Med	Max
7	1	1.714	0.714	0.23	1.74	2.28
9	2	2.628	2.321	0.84	1.4	8.12
9	3	2.668	2.208	0.6	1.48	6.67
8	4	2.324	2.21	0.25	1.59	7.21
9	5	5.79	2.213	3.5	4.5	9.67
8	6	5.309	3.331	1.24	5.08	10.59
8	7	7.425	2.612	3.2	6.12	10.76
8	8	6.983	2.319	4.34	5.06	9.72
8	9	6.491	3.363	1.71	6.83	11.09
7	10	2.073	2.735	0.07	0.37	6.83
8	11	1.326	0.677	0.31	1.56	2.06
9	12	2.342	1.74	0.23	1.64	4.8

Table B2_1. Monthly and Annual Sums for Station Tree Far_R, dbkey 3553

year	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	SUM	
74	-----	-----	-----	-----	-----	-----	-----	-----	-----	5.17	0.44	1.74	7.4	*
75	1.31	1.41	0.84	1.67	10.68	5.71	8.39	7.66	5.46	1.55	0.72	0.43	45.8	
76	0.23	0.58	2.7	1.8	6.47	5.39	12.38	3.62	6.23	0.4	2.07	2.16	44.0	
77	-----	2.09	1	0.4	3.82	2.05	10.46	5.37	11.46	1.86	-----	3.88	42.4	*
78	-----	-----	2.85	-----	-----	-----	-----	-----	-----	-----	-----	-----	2.9	*
79	-----	-----	-----	-----	7.53	6.26	2.78	-----	15.02	-----	-----	-----	31.6	*
80	-----	-----	-----	-----	-----	3.43	-----	1.54	1.8	0.98	4.77	0.48	13.1	*
81	-----	3.3	-----	0.05	1.63	10.46	1.88	-----	6.41	1.73	1.46	3.07	30.0	*
82	-----	2.56	6.7	-----	6.93	8.33	8.67	8.2	4.58	1.33	0.9	0.4	48.6	*
83	1.01	7	4.28	2.48	2.55	8.71	4.38	7.07	7.41	5.37	1.05	3.99	55.3	
84	0.6	2.4	1.38	5.33	4.23	3.86	10.76	4.47	3	-----	-----	-----	36.0	*
85	-----	-----	-----	-----	-----	-----	-----	-----	-----	4.04	0.26	3.65	8.0	*
86	6.32	1.68	2.86	0.53	0.93	9.01	5.42	11.77	2.97	4.09	0.21	2.14	48.0	*

* Partial: Annual sum based on cumulative rainfall in less than 12 months

Table B2_2. Statistics of the Monthly Sums for Station Tree Far_R, dbkey 3553

#yrs	month	Mean	Var	Min	Med	Max
6	1	1.578	2.373	0	0.6	6.32
8	2	2.628	1.945	0.58	2.09	7
8	3	2.826	1.946	0.84	2.7	6.7
7	4	1.751	1.806	0.05	0.53	5.33
9	5	4.974	3.171	0.93	3.82	10.68
10	6	6.321	2.749	2.05	5.71	10.46
9	7	7.236	3.753	1.88	5.42	12.38
8	8	6.213	3.162	1.54	5.37	11.77
10	9	6.434	4.077	1.8	5.46	15.02
10	10	2.652	1.827	0.4	1.73	5.37
9	11	1.32	1.424	0.21	0.72	4.77
10	12	2.194	1.431	0.4	2.14	3.99

Table B3_1. Monthly and Annual Sums for Station S-405_R, dbkey 3554

year	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	SUM	
74	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.1	0.35	1.65	2.1	*
75	1.23	1.58	0.88	1.91	7.15	7.08	7.23	6.41	5.55	2.21	1.23	0.52	43.0	
76	0.32	0.5	1.95	2.52	6.91	5.62	11.12	3.02	6.72	0.55	2.52	1.83	43.6	
77	-----	2.03	1.4	0.4	3.57	4.35	9.39	6.71	5.48	-----	2.45	3.95	39.7	*
78	-----	5.11	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	5.1	*
79	-----	1.78	3.04	-----	6.09	8.32	3.33	7.01	-----	-----	-----	-----	29.6	*
80	-----	1.48	1.83	3.24	7.75	2.72	8.82	-----	1.37	2.25	4.81	0.69	35.0	*
81	-----	4.56	1.96	0	-----	9.77	2.67	5.82	-----	1.5	-----	-----	26.3	*
82	-----	1.8	-----	-----	4.78	-----	-----	7.53	7.13	1.98	0.9	0.45	24.6	*
83	1.73	6.88	4.83	2.95	2.17	8.25	4.75	7.36	5.06	5.09	1.15	3.7	53.9	
84	2.35	2.44	1.18	1.49	2.77	5.7	10.49	4.58	3.13	-----	-----	-----	34.1	*
85	-----	-----	-----	-----	-----	-----	-----	-----	-----	4.27	0.33	4.76	9.4	*
86	5.49	1.95	2.79	0.65	0.84	9	5.33	9.8	1.89	3.4	0.9	0.75	42.8	
87	1.2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.2	*

* Partial: Annual sum based on cumulative rainfall in less than 12 months

Table B3_2. Statistics of the Monthly Sums for Station S-405_R, dbkey 3554

#yrs	month	Mean	Var	Min	Med	Max
6	1	2.053	1.812	0.32	1.23	5.49
11	2	2.737	1.925	0.5	1.8	6.88
9	3	2.207	1.207	0.88	1.83	4.83
8	4	1.645	1.216	0	1.49	3.24
9	5	4.67	2.46	0.84	3.57	7.75
9	6	6.757	2.329	2.72	5.7	9.77
9	7	7.014	3.128	2.67	5.33	11.12
9	8	6.471	1.912	3.02	6.41	9.8
8	9	4.541	2.161	1.37	5.06	7.13
9	10	2.372	1.639	0.1	1.98	5.09
9	11	1.627	1.43	0.33	0.9	4.81
9	12	2.033	1.67	0.45	0.75	4.76

Table B4_1. Monthly and Annual Sums for Station Bay, dbkey 3562

year	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	SUM	
74	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.2	0.7	1.88	2.8	*
75	1.72	1.29	0.98	2.14	6.49	5.56	9.01	7.84	6.69	2.8	1.38	0.43	46.3	
76	0.53	0.66	0.99	2.52	6.38	6.55	10.09	3.27	5	0.47	2.67	1.83	41.0	
77	1.31	2	1.18	0.25	4.24	3.65	9.58	5.35	4.95	2.63	2.39	4.57	42.1	
78	2.95	6.12	3.26	1.62	4.47	8.35	13.33	2.05	1.37	3.8	0.04	4.69	52.1	
79	7.39	2.08	3.18	2.41	7.36	4.63	3.2	8.7	11.07	0.5	3.68	0.92	55.1	
80	1.78	1.47	1.81	3.42	7.13	2.76	5.22	3.33	1.82	0.91	4.32	0.63	34.6	
81	0.45	4.65	2.51	0.05	2.99	7.78	5.93	6.39	7.84	1.28	2.07	2.84	44.8	
82	-----	1.93	6.98	4.45	5.17	9.12	7.03	7.78	9.43	4.26	0.76	0.63	57.5	*
83	2.01	7.64	5.42	3.59	2.37	7.88	4.72	8.66	5.6	4.2	1.34	3.54	57.0	
84	2.16	2.32	1.1	3.44	3.29	4.15	13.25	4.75	2.98	-----	-----	-----	37.4	*
85	-----	-----	-----	-----	-----	-----	-----	-----	-----	4.68	0.33	4.76	9.8	*
86	7.52	2.52	2.8	0.62	1.02	11.17	5.86	10.94	4.74	3.99	2.16	1.96	55.3	
87	0.66	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.7	*

* Partial: Annual sum based on cumulative rainfall in less than 12 months

Table B4_2. Statistics of the Monthly Sums for Station Bay, dbkey 3562

#yrs	month	Mean	Var	Min	Med	Max
11	1	2.589	2.522	0.45	1.72	7.52
11	2	2.971	2.2	0.66	2	7.64
11	3	2.746	1.945	0.98	1.81	6.98
11	4	2.228	1.464	0.05	2.14	4.45
11	5	4.628	2.081	1.02	4.24	7.36
11	6	6.509	2.601	2.76	5.56	11.17
11	7	7.929	3.393	3.2	5.93	13.33
11	8	6.278	2.771	2.05	5.35	10.94
11	9	5.59	3.023	1.37	4.95	11.07
12	10	2.477	1.71	0.2	2.63	4.68
12	11	1.82	1.319	0.04	1.38	4.32
12	12	2.39	1.655	0.43	1.88	4.76

Table B5_1. Monthly and Annual Sums for Station Kirchoff_R, dbkey 5862

year	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	SUM	
69	-----	-----	-----	-----	-----	1.38	6.65	5.49	5.55	6.08	2.75	4.04	31.9	*
70	2.77	3.03	6.16	1.21	3.83	4.14	8.08	5.01	2.93	3.14	0.51	1.22	42.03	
71	0.74	3.23	3.31	0.96	5.16	5.4	8.39	4.18	1.1	5.84	0.66	0.6	39.6	
72	1.43	2.25	1.65	0.79	2.08	6.26	3.05	4.52	0.52	4.92	2.29	2.68	32.4	
73	4.92	2.7	2.88	2.44	-----	3.88	2.56	7.67	8.07	2.55	0.44	1.97	40.1	*
74	0.18	0.48	1.54	0.99	2.63	15.61	6.71	-----	7.26	0.11	0.18	1.48	37.2	*
75	0.74	1.6	1.22	0.66	7.11	7.15	4.96	8.01	6.73	4.06	0.75	0.32	43.3	
76	0.36	0.69	1.78	1.8	5.63	2.89	5.79	7.79	4.71	0.31	2.73	3.99	38.5	
77	1.59	2.51	0.92	0.16	1.19	8.2	7.11	12.38	1.47	1.67	2.33	0.46	40.0	
78	2.45	3.7	1.51	0.17	3.76	4.55	-----	-----	2.23	1.11	0.42	3.82	23.7	*
79	6.4	0.94	2.26	3.4	8.18	2.48	4.48	11.28	14.17	1.04	1.82	1.6	58.1	
80	5.12	3.2	1.71	1.88	7.61	1.08	4.69	4.29	2.53	1.14	5.13	0.74	39.1	

Table B5_1 (Continued)

year	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	SUM	
81	0.24	2.31	0.79	0.02	2.11	7.33	1.53	5.77	5.83	0.48	2.21	2.47	31.1	
82	1.37	0.99	5.73	4.72	10.81	7.85	7.98	4.88	10.6	4.01	0.58	0.58	60.1	
83	1.67	8.99	4.6	2.6	1.94	8.88	4.93	3.8	2.55	3.73	1.74	7.95	53.4	
84	0.82	3.62	1.13	1.64	6.85	6.32	5.28	3.31	3.43	1.14	2.42	0.29	36.3	
85	0.62	0.72	3.16	0.65	3.47	5.45	6.33	4.28	5.12	2.74	0.69	1.53	34.8	
86	4.14	2.34	2.68	0.43	0.59	4.86	7.3	3.23	4.3	2.18	0.75	4.81	37.6	
87	1.32	0.86	5.35	0.17	4.03	3.85	3.05	5.83	5.1	7.68	6.45	1.4	45.1	
88	1.08	0.36	4.65	1.05	1.53	1.95	11.89	7.98	4.01	0.4	2.61	2.19	39.7	
89	3.01	1.68	0.82	1.17	0.64	2.04	11.76	0.12	-----	1.97	0.83	10.56	34.6	*
90	0.51	2.56	2.31	1.88	1.99	4.85	7.99	7.51	4.47	2.3	3.14	1.47	41.0	
91	2.27	0.34	5.3	5.59	2.56	7.03	13.36	9.56	3.48	4.58	0.14	0.41	54.6	
92	1.13	2.27	0.92	3.88	0.68	12	4.44	3.27	6.12	0.19	6.81	1.32	43.0	
93	7.1	1.24	5.98	3.54	-----	-----	5.55	2.8	6.95	3.7	0.1	1.22	38.2	*
94	3.58	3.32	-----	-----	3.1	7.91	3.99	6.26	8.51	4.14	10.3	3.08	54.2	*
95	1.37	1.31	3.61	1.85	3.28	5.47	9.15	10.59	4.72	5.25	0.53	0.65	47.8	
96	4	2.73	-----	-----	-----	-----	2.89	4.23	3.98	5.59	0.41	3.29	27.1	*
97	-----	0.35	1.26	1.98	1.97	5.23	6.53	5.42	2.62	3.85	-----	-----	29.2	*
98	-----	3.11	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	3.1	*

* Partial: Annual sum based on cumulative rainfall in less than 12 months

Table B5_2. Statistics of the Monthly Sums for Station Kirchoff_R, dbkey 5862

#yrs	month	Mean	Var	Min	Med	Max
28	1	2.152	1.965	-----	1.37	7.1
29	2	2.187	1.7	0.34	2.25	8.99
26	3	2.817	1.794	0.79	2.26	6.16
26	4	1.755	1.459	0.02	1.21	5.59
25	5	3.709	2.66	0.59	2.63	10.81
27	6	5.705	3.217	1.08	5.229	15.61
28	7	6.301	2.88	1.53	5.79	13.36
27	8	5.906	2.827	0.12	5.01	12.38
29	9	4.772	3.089	-----	4.3	14.17
29	10	2.962	2.051	0.11	2.55	7.685
29	11	2.033	2.426	-----	0.75	10.3
29	12	2.254	2.378	-----	1.47	10.56

Table B6_1. Monthly and Annual Sums for Station Islewort_R, dbkey 6144

year	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	SUM	
16	-----	-----	0.8	3.09	6.21	5.38	6.37	3.89	3.55	2.06	3.31	5.74	40.4	*
17	1.16	0.81	2.22	1.17	3.03	4.07	7.16	7.95	9.64	4.15	0	0.85	42.2	
18	3.11	0	2.34	7.57	2.89	6	6.33	2.25	6.73	4.29	3.38	2.59	47.5	
19	2.9	5.25	4.2	1.47	8.55	7.64	6.42	6.53	4.49	0.58	3	4.15	55.2	
20	1.17	4.35	0.27	6.69	3.97	4.23	7.54	6.9	10.75	0	3.22	1.98	51.1	
21	0.5	2.13	0.62	2.46	-----	-----	8.68	3.68	0.95	-----	-----	2.73	21.8	*
22	-----	1	0.53	0.35	8.14	7.42	4.96	9.41	7.98	6.39	0.62	1.02	47.8	*
23	0.55	0.1	2.16	1.52	8.72	6.41	5.01	5.35	3.4	3.98	0	1.53	38.7	
24	2.6	4.46	7.2	3.25	4	9.06	8.47	4.82	8.65	8	0.2	0.54	61.3	

Table B6_1. (Continued)

year	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	SUM	
25	4.2	1.62	1.25	0.5	3.45	4.53	6.54	8.58	2.99	1.14	5.99	4.17	45.0	
26	5.18	1.43	4.88	5.91	0.8	12.11	11.79	6.92	3.47	1.02	3.7	0.36	57.6	
27	0.1	2.59	3.25	0.6	1.2	3	7.75	7.33	2.48	2.68	1.01	1.11	33.1	
28	0.9	1.33	3.8	8.77	3.56	6.05	5.24	9.56	9.25	0.73	-----	0.56	49.8	*
29	1.32	0.76	0.93	1.25	5.97	-----	9.78	4.14	9.61	2.91	0.98	1.63	39.3	*
30	2.28	4.03	9.19	3.49	3.41	17.5	4.79	5.8	9.9	2.2	1.02	5	68.6	
31	2.76	1.5	7.02	3.79	3.34	2.15	8.85	8.57	5.96	0.76	0.22	2.26	47.2	
32	0.75	0.62	3.5	1.29	7.14	10.04	1	11.76	3.34	1.33	4.93	0.04	45.7	
33	2.26	3.47	1.61	3.16	4.32	5.9	7.85	8.63	11.5	2.5	1.78	0.38	53.4	
34	0.91	4.47	3.08	4.52	7.8	15.89	9.24	6.57	3.8	3.98	0.3	0.48	61.0	
35	1.21	3.34	1.45	3.47	4.28	8.73	9.91	4.54	10.68	5.14	0.72	3.28	56.8	
36	4.04	7.65	3.2	0.47	8.56	8.97	5.76	4.86	4.77	3.62	1.85	1	54.8	
37	0.5	4.95	3.37	2.45	3.75	6.74	6.77	9.95	4.91	5.65	3.59	1.23	53.9	
38	1.13	0.37	2.51	0.03	9.29	3.89	7.15	4.09	5.77	3.87	0.63	0.33	39.1	
39	1.29	0.31	0.65	4.76	3.71	12.22	10.3	14.89	5.06	1.27	0.33	1.1	55.9	
40	1.94	3.59	3.13	2.22	2.55	8.37	8.09	4.73	4.58	0.03	0.22	5.62	45.1	
41	5.07	3.59	3.6	4.76	1.76	9.67	14.5	3.58	5.32	2.71	4.57	2.26	61.4	
42	2.22	2.95	5.36	1.87	1.31	12.47	6.98	5.03	6.23	0.4	0.17	2.67	47.7	
43	1.97	0.73	5.02	2.21	3.14	8.3	8.8	5.83	10.17	1.5	1.12	1.59	50.4	
44	2.06	0.34	5.5	2.59	3.11	7.11	21.49	6.65	5.96	8.87	0.24	0.09	64.0	
45	3.93	0.18	0	1.03	1.76	15.02	12.24	6.19	11.11	2.19	0.5	3.32	57.5	
46	1.7	3.43	1.64	0.68	7.88	5.5	10.25	8.24	7	2.58	1.04	2.34	52.3	
47	0.58	4.56	5.42	5.14	4.53	10.62	8	6.59	10.32	1.9	2.35	0.81	60.8	
48	6.41	0.9	3.24	2.77	0.85	4.07	7.99	11.65	10.91	3.25	1.1	1.51	54.7	
49	0.46	0.9	0.7	2.23	1.83	9.85	6.4	11.27	5.37	1.01	0.87	3.26	44.2	
50	0.13	0.49	3.52	3.41	2.17	4.58	4.46	2.61	12.97	10.87	0.05	4.75	50.0	
51	0.51	2.52	1.27	4.85	1.88	6.15	7.58	4.89	6.05	2.31	5.25	1.88	45.1	
52	0.9	5.82	4.53	1.88	6.62	2.94	3.82	3.11	5.59	3.7	0.78	0.6	40.3	
53	2.32	2.6	2.47	8.46	1.43	14.68	10.17	11.28	13.9	3.46	4.37	3.64	78.8	
54	1.22	1.03	1.13	3.64	3.75	3.86	5.2	4.23	2.56	4.1	2.88	1.73	35.3	
55	2.04	1.24	1.63	1.81	4.55	7.52	6.92	5.21	4.75	2.66	2.57	2.3	43.2	
56	2.24	1.12	0.48	2.7	6.24	3.63	2.29	6.84	8.78	13.25	0.44	0.19	48.2	
57	0.84	2.78	3.47	4.6	13.66	8.08	6.11	8.13	9.68	1.48	0.86	3.51	63.2	
58	4.54	3.17	6.95	5.02	3.54	4.91	3.3	4.71	4.27	4.64	1.54	3.42	50.0	
59	3.37	4.81	9.23	5.46	2.65	9.55	8.91	12.68	6.52	8	0.54	1.49	73.2	
60	1.71	5.26	13.33	2.65	2.33	5.95	12.48	4.46	15.26	2.25	0.18	1.3	67.2	
61	1.63	3.61	4.64	0.8	3.25	7.26	7.21	5.1	2.86	3.01	2.08	1.15	42.6	
62	1.32	3.17	3.65	1.05	4	8.28	7.71	11.38	7.37	0.82	1.67	0.56	51.0	
63	3.53	5.52	2.97	2.82	2.89	4.52	8.6	6.23	7.71	0.16	6.93	2.26	54.1	
64	6.21	3.38	4.91	2.5	2.66	7.28	3.09	14.05	8.44	1.09	1.46	1.47	56.5	
65	2.36	3.46	2.69	0.83	1.14	8	8.15	6.93	4.1	4.15	1.66	2.78	46.3	
66	4.82	5.95	2.17	1.68	5.53	9.91	7.75	12.33	5.78	1.78	0.22	0.9	58.8	
67	1.28	5.3	1.42	0.05	2.14	8.5	10.16	6.8	4.05	0.37	0.17	2.63	42.9	
68	0.77	2.33	1.8	0.25	4.83	12.19	8.3	5.25	3	3.87	2.28	0.61	45.5	
69	2.48	3.53	6.2	3.41	1.9	8.95	7	8.28	10.15	6.8	3.07	5.29	67.1	
70	3.99	5.68	3.78	0.62	4.22	7.24	5.89	3.25	2.41	2.23	0.85	1.57	41.7	
71	1.02	3.87	1.47	1.96	7.07	4.76	11.56	7.61	5.14	4.35	1.79	1.92	52.5	

Table B6_1. (Continued)

year	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	SUM	
72	2.39	5.4	4.94	1.48	3.22	8.65	5.46	10	0.09	1.39	4.37	2.12	49.5	
73	4.48	2.29	5.02	2.21	4.33	2.59	7.22	8.54	4.2	1.29	0.58	3.34	46.1	
74	0.27	2.18	4.59	0.39	4.05	15.3	8.6	6.03	10.49	0.22	0.2	1.75	54.1	
75	2.21	1.64	1.41	1.38	5.58	8.11	11.72	6.71	8.75	4.71	1.19	0.77	54.2	
76	0.49	0.85	3.31	3.6	8.56	5.04	7.7	5.19	4.56	0.64	2.02	1.92	43.9	
77	2	1.86	1.05	0.31	3.58	2.39	11.39	5.82	2.78	1.16	2.38	3.78	38.5	
78	2.33	5.24	3.81	0.88	2.58	10.16	9.91	5.05	1.63	2.25	0	4.07	47.9	
79	6.44	1.4	3.37	1.53	9.63	4.09	6	11.06	10.06	0.14	4.2	0.77	58.7	
80	2.59	1.76	1.45	1.79	6.83	2.66	4.57	4.31	3.18	1.45	4.43	0.51	35.5	
81	0.22	3.79	2.8	0.38	2.47	5.66	7.22	9.44	10.81	1.65	2.29	3.23	50.0	
82	2.31	1.95	6.02	6	8.56	10.81	8.79	9.15	6.04	5.32	1.96	0.79	67.7	
83	-----	7.48	5.75	-----	-----	-----	-----	-----	-----	-----	-----	-----	13.2	*

* Partial: Annual sum based on cumulative rainfall in less than 12 months

Table B6_2. Statistics of the Monthly Sums for Station Islewort_R, dbkey 6144

#yrs	month	Mean	Var	Min	Med	Max
67	1	2.098	1.653	-----	1.94	6.44
67	2	2.839	1.903	0	2.59	7.65
68	3	3.395	2.411	0	3.2	13.33
67	4	2.656	2.044	0.03	2.21	8.77
67	5	4.356	2.683	-----	3.58	13.66
67	6	7.337	3.763	-----	7.24	17.5
67	7	7.816	3.032	1	7.58	21.49
67	8	7.066	2.881	2.25	6.57	14.89
67	9	6.575	3.344	0.09	5.78	15.26
67	10	2.948	2.623	-----	2.25	13.25
67	11	1.741	1.698	-----	1.1	6.93
67	12	2.038	1.447	0.04	1.63	5.74

Table B7_1. Monthly and Annual Sums for Station Chapmans_R, dbkey 6228

year	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	SUM	
65	-----	2.7	1.77	2.88	0.42	6.22	10.45	11.89	4.77	4.69	0.82	3.08	49.7	*
66	6.01	4.52	0.01	6.35	-----	9.14	6.57	7.74	6.38	-----	-----	1.14	47.9	*
67	0.74	-----	-----	-----	-----	-----	-----	-----	-----	0.4	0.12	2.02	3.30	*
68	0.32	2.99	1.65	0.46	8.98	12.86	7.66	9.54	3.62	6.04	1.93	0.77	56.8	
69	1.79	3.53	7	3.01	1.3	1.91	4.97	8.4	13.07	8.99	0.3	7.84	62.1	
70	4.17	3.23	4.44	0.47	3.55	5.3	9.38	3.04	5.49	-----	0.36	-----	39.4	*
72	-----	-----	-----	-----	-----	-----	-----	10.29	4.15	0.57	2.74	-----	17.8	*
73	1.58	0.63	2.01	1.5	2.46	4.52	7.98	6.1	4.39	2.32	0.5	2.96	37.0	
74	0.47	0	0.13	1.48	1.53	4.11	5.54	6.49	1.26	1.47	0.7	0	23.2	
75	0	0	0	0.83	3.75	7.93	9.44	5.14	6.92	3.27	1.32	0.62	39.2	
76	0.25	3.22	0.17	2.16	8.63	12.12	1.22	8.76	7.77	4.14	3.56	1.07	53.1	
77	1.59	1.17	0.68	1.27	7.53	5.9	4.58	-----	9.92	1.18	3.27	1.55	38.6	*

* Partial: Annual sum based on cumulative rainfall in less than 12 months

Table B7_2. Statistics of the Monthly Sums for Station Chapmans_R, dbkey 6228

#yrs	month	Mean	Var	Min	Med	Max
10	1	1.692	1.945	0	0.738	6.01
10	2	2.199	1.61	0	2.7	4.52
10	3	1.786	2.291	0	0.68	7
10	4	2.041	1.759	0.46	1.48	6.35
9	5	4.239	3.298	0.42	2.46	8.98
10	6	7.001	3.514	1.91	5.9	12.86
10	7	6.779	2.791	1.22	6.57	10.45
11	8	6.966	3.569	-----	6.49	11.89
11	9	6.158	3.242	1.26	4.77	13.07
10	10	3.307	2.732	0.4	2.32	8.99
11	11	1.42	1.257	0.12	0.7	3.56
12	12	1.683	2.261	-----	1.07	7.84

APPENDIX C

Charts for Historical Daily Stage Data

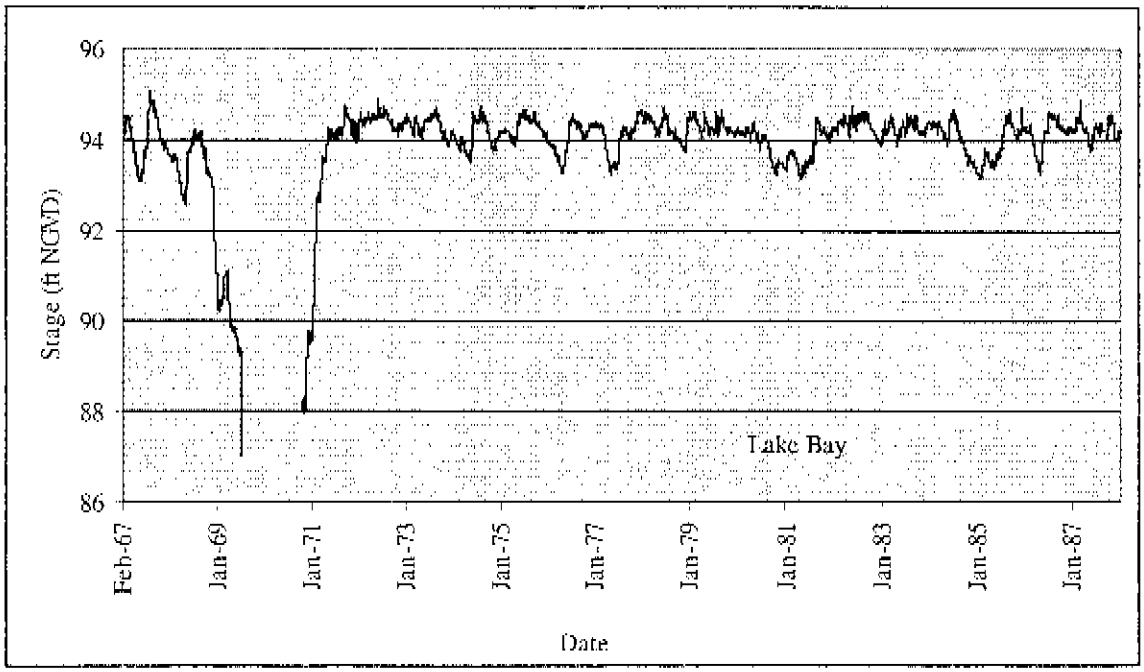

Figure C1-1. Historical daily stage at Lake Bay.

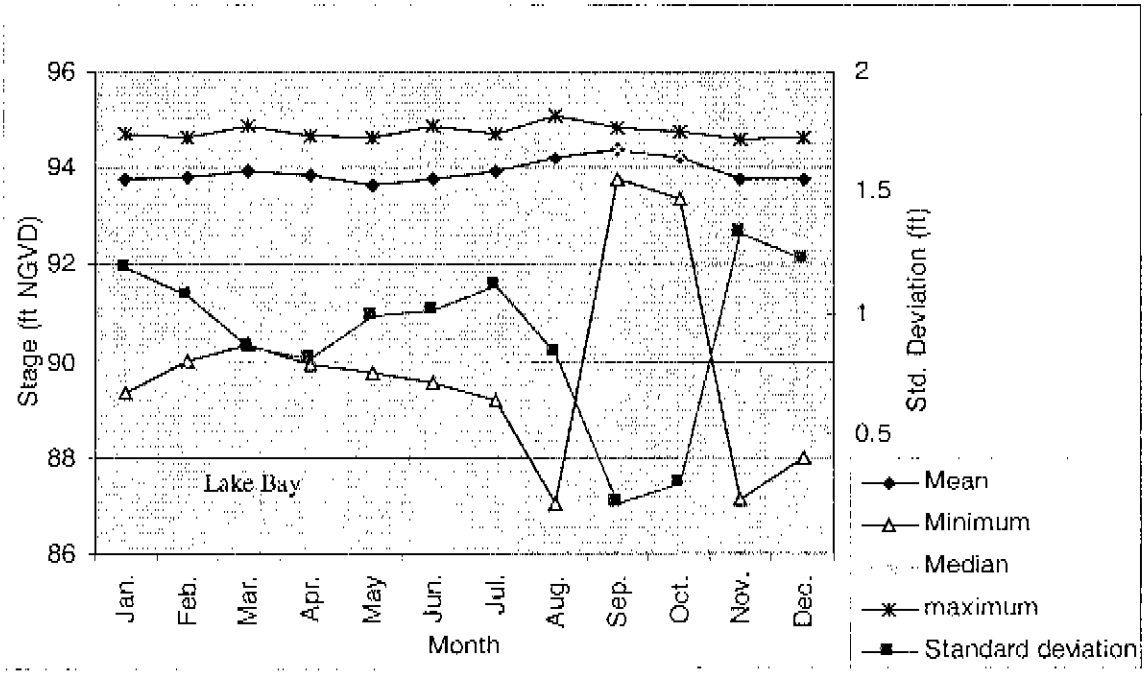

Figure C1-2. Monthly statistics for stage data at Lake Bay.

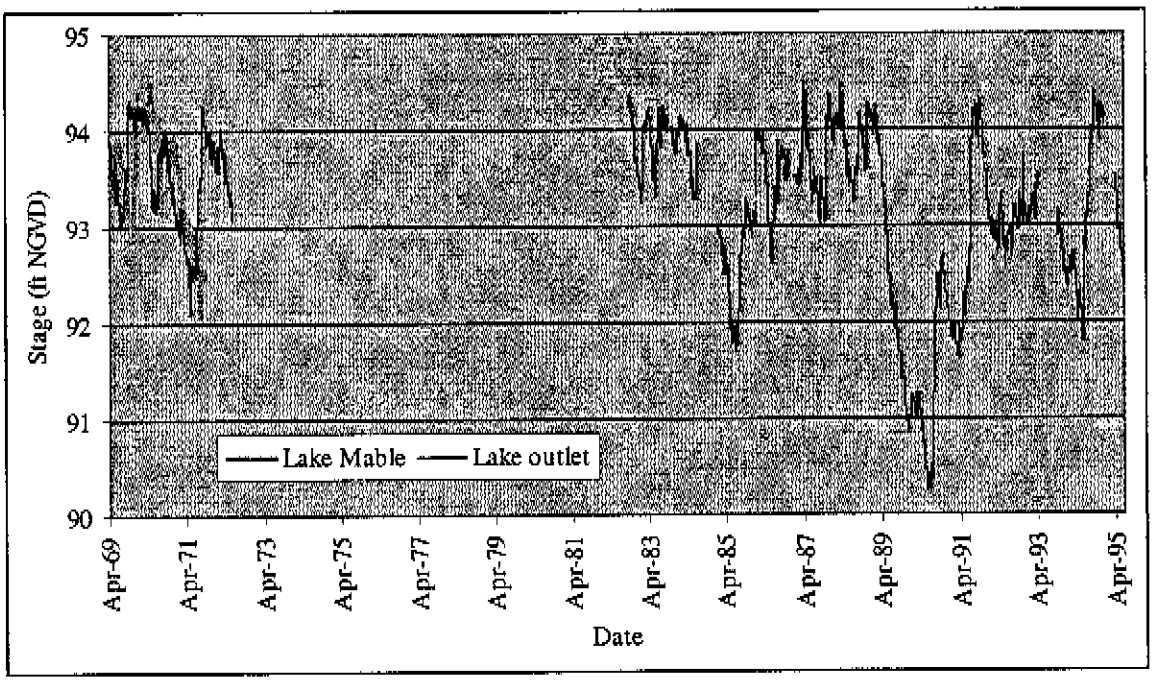

Figure C2-1. Historical daily average stage at Lake Mable.

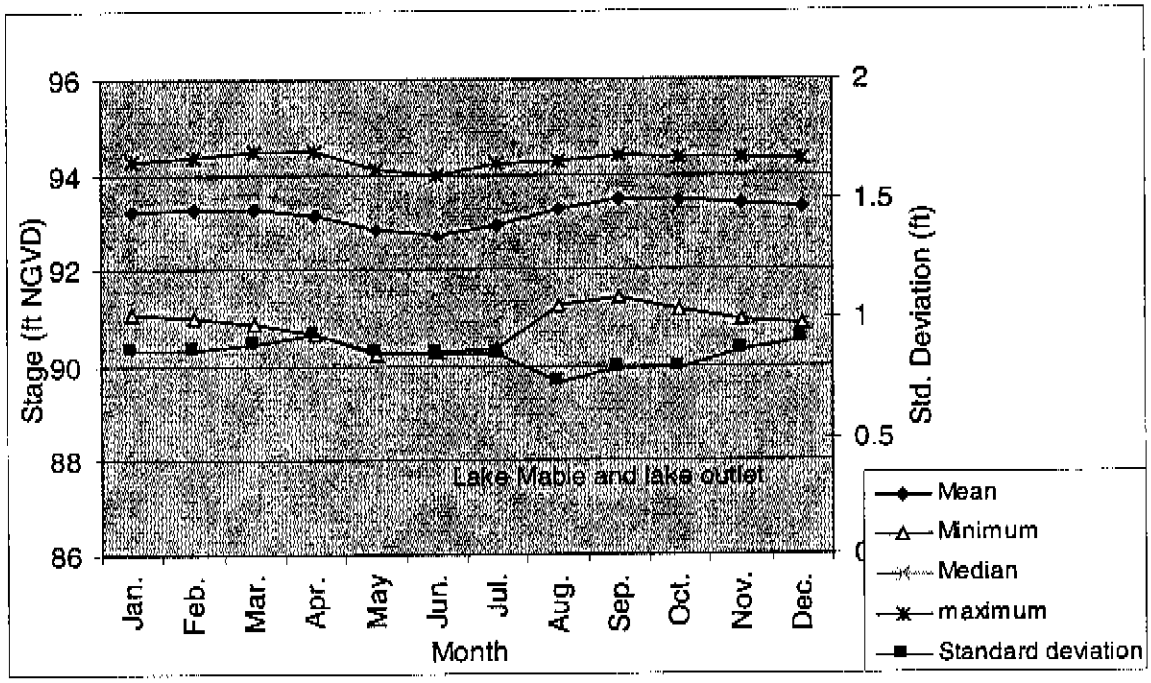

Figure C2-2. Monthly statistics for stage data at Lake Mable.

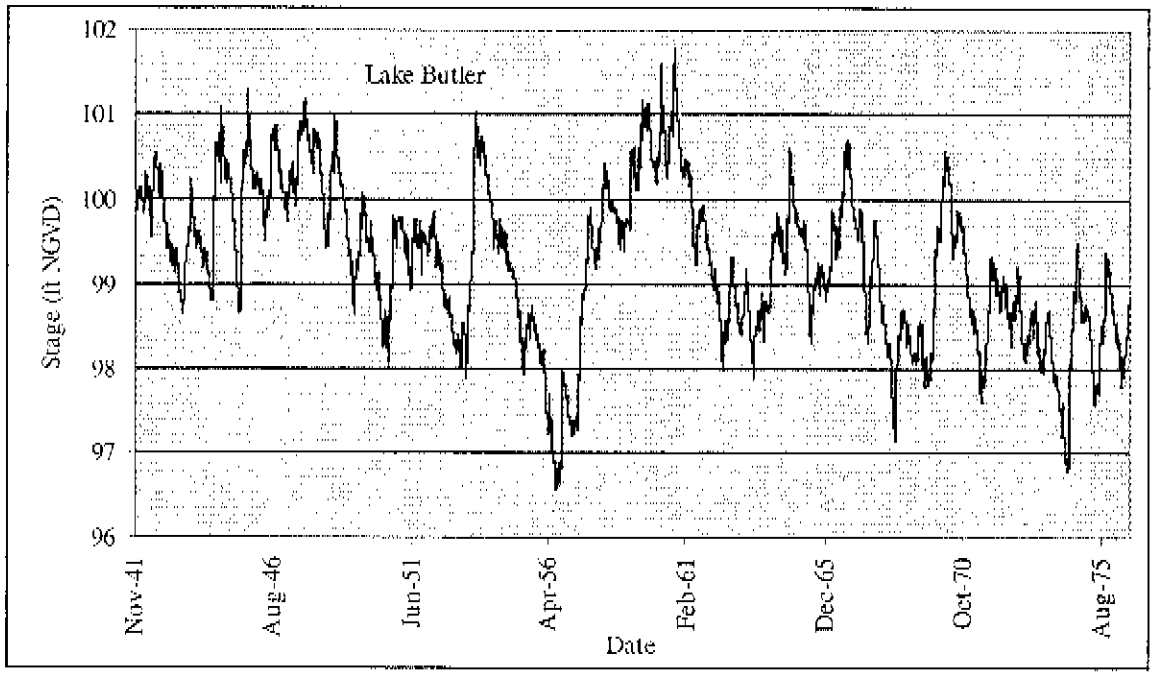

Figure C3-1. Historical daily stage at lake Butler.

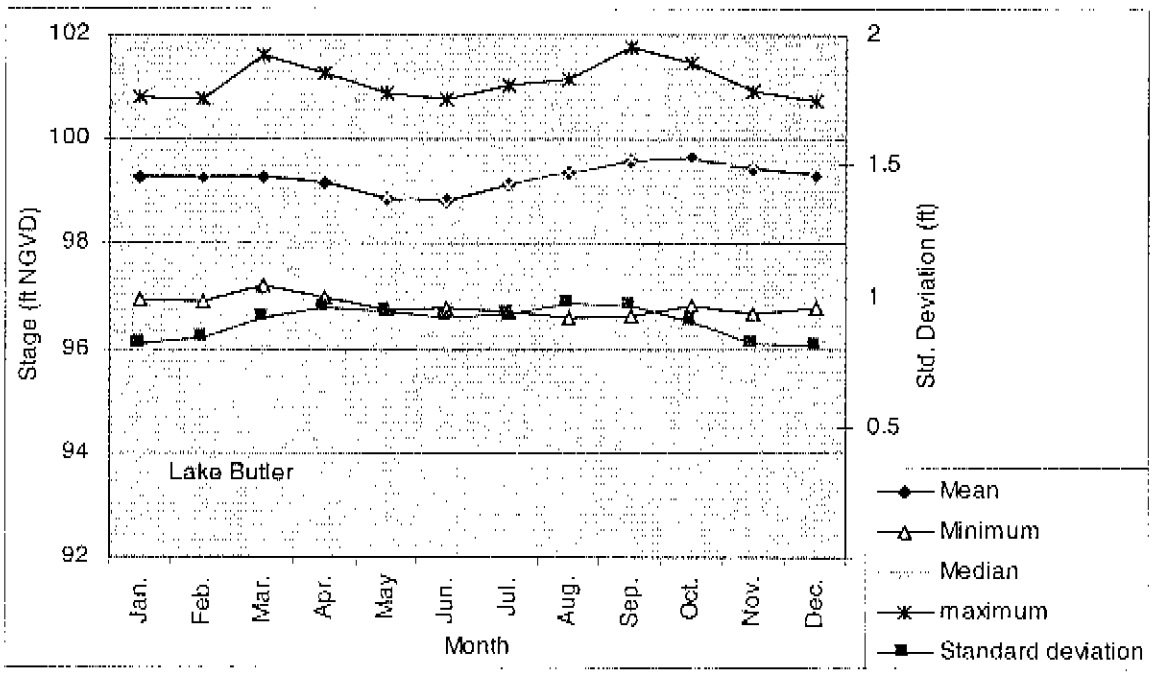

Figure C3-2. Monthly statistics for stage data at Lake Butler.

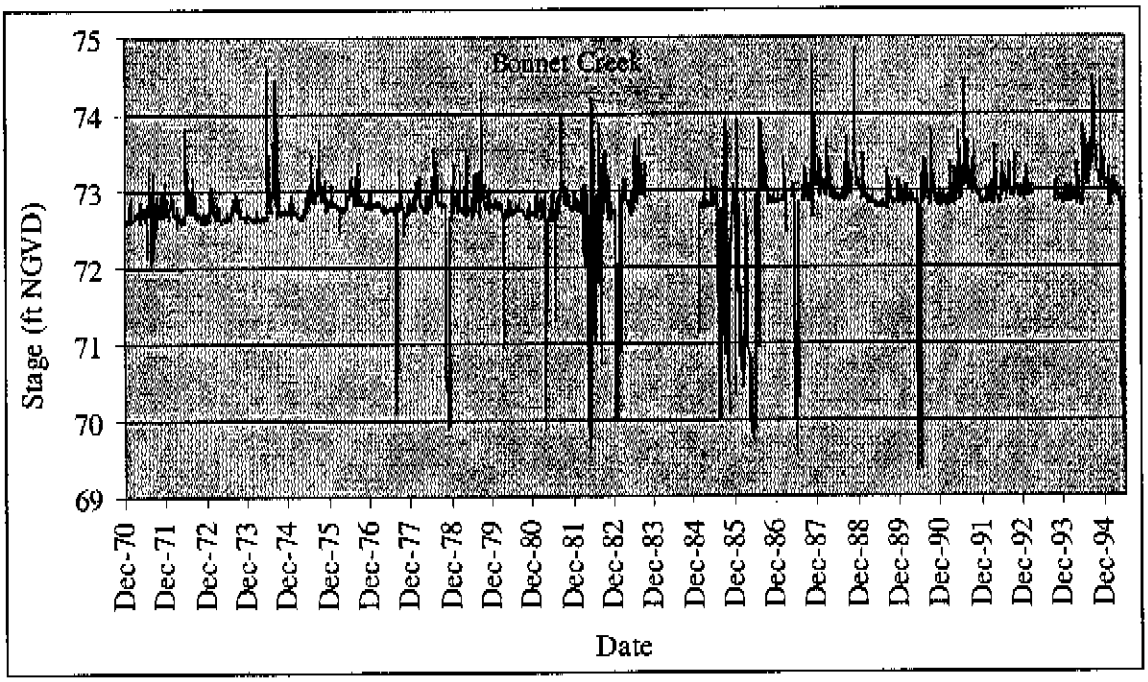

Figure C4-1. Historical daily stage at Bonnet Creek

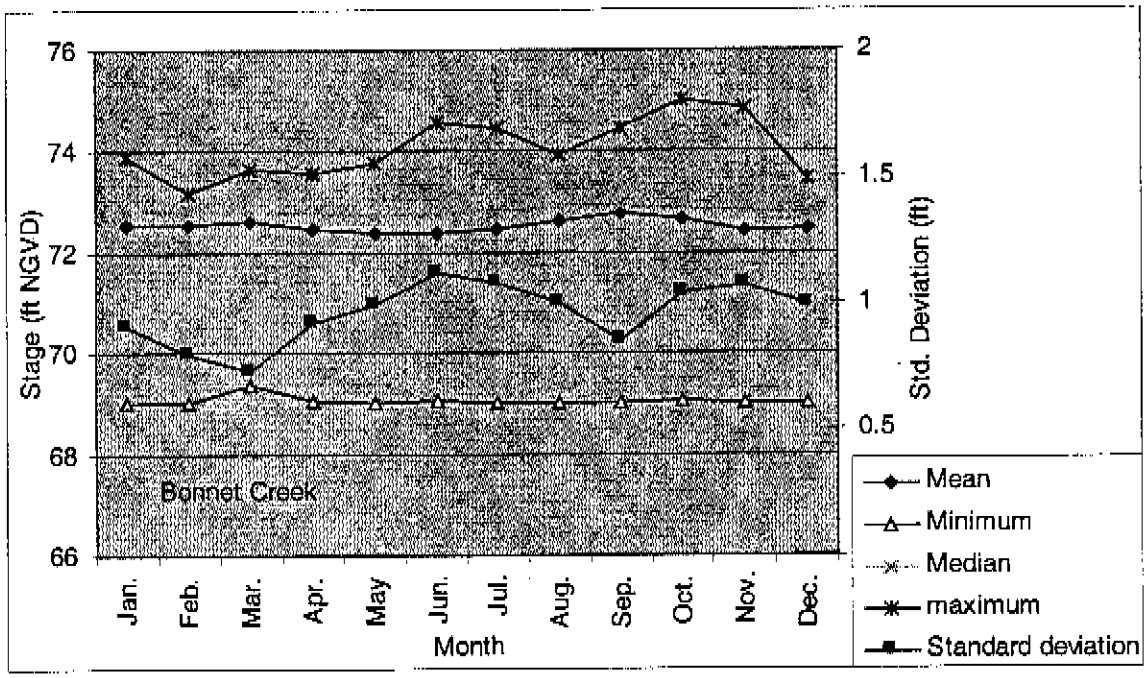

Figure C4-2. Monthly statistics for stage data at Bonnet Creek.

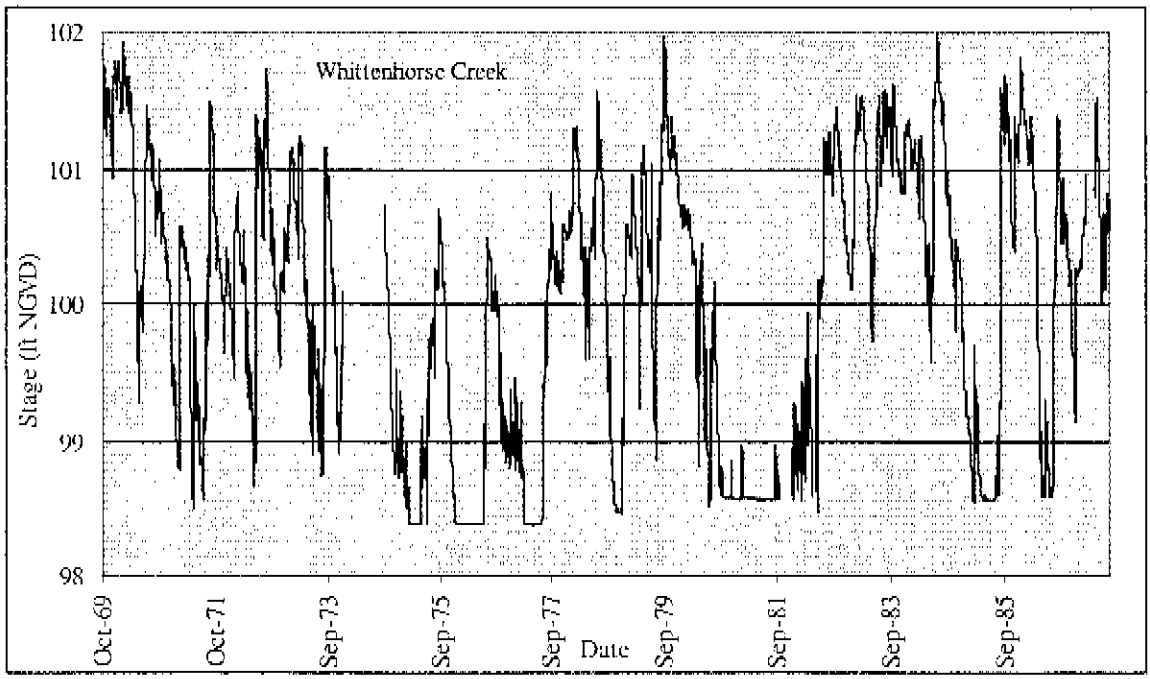

Figure C5-1. Historical daily stage at Whittenhorse Creek.

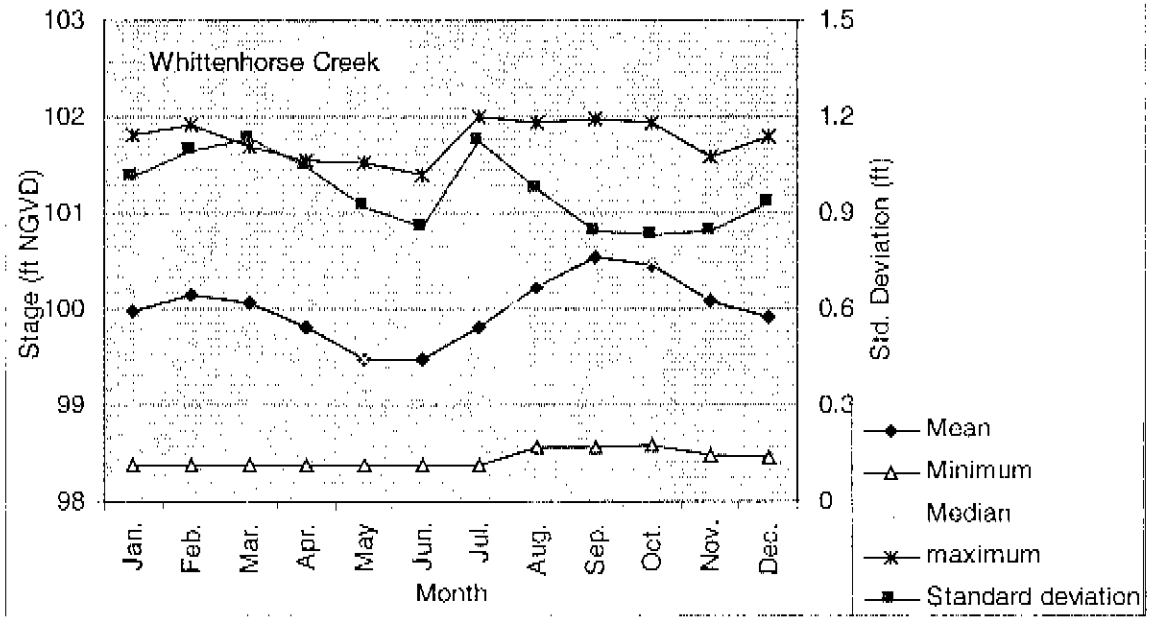

Figure C5-2. Monthly statistics for stage data at Whittenhorse Creek.

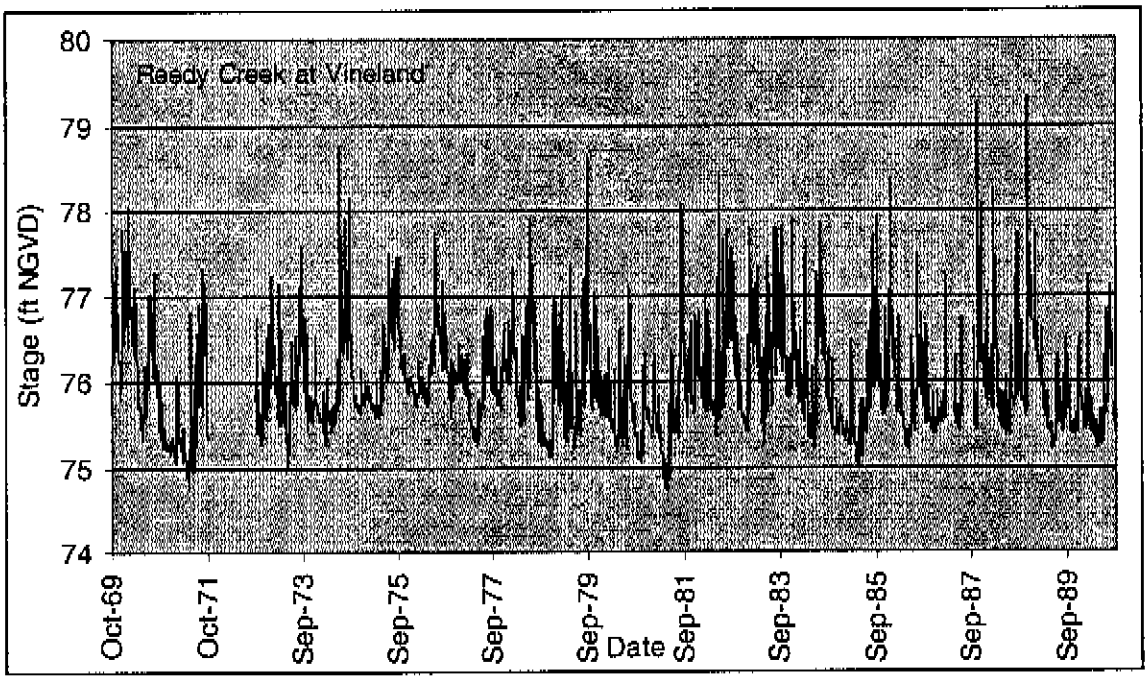

Figure C6-1. Historical daily stage at Reedy Creek at Vineland.

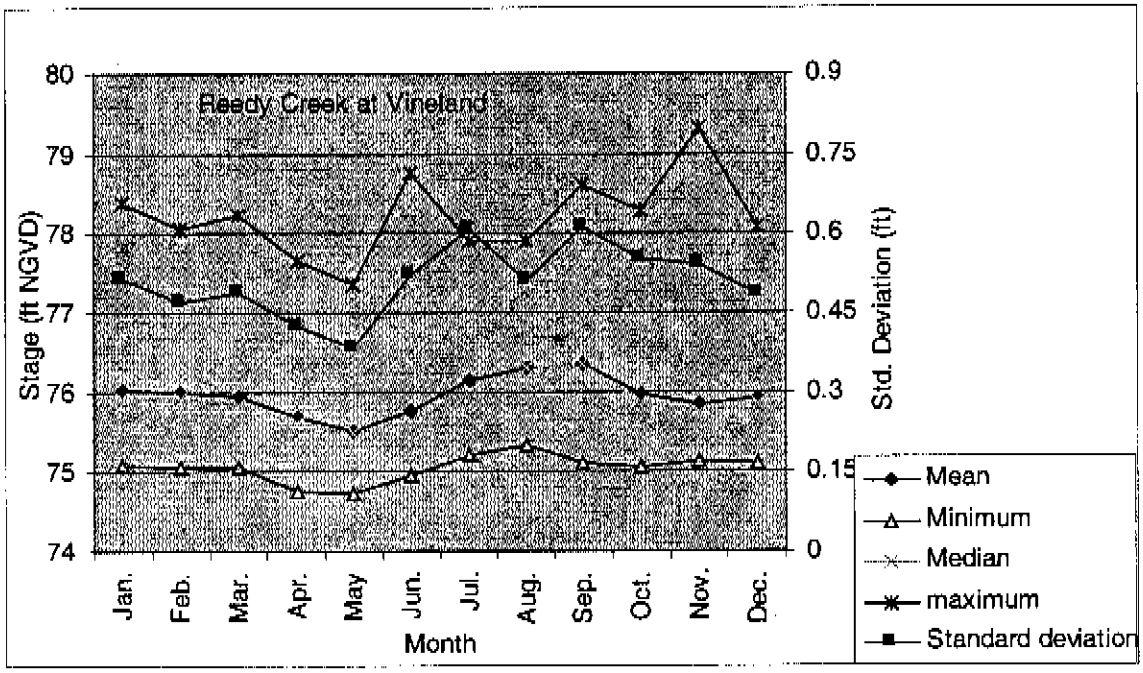

Figure C6-2. Monthly statistics for stage data at Reedy Creek at Vineland.

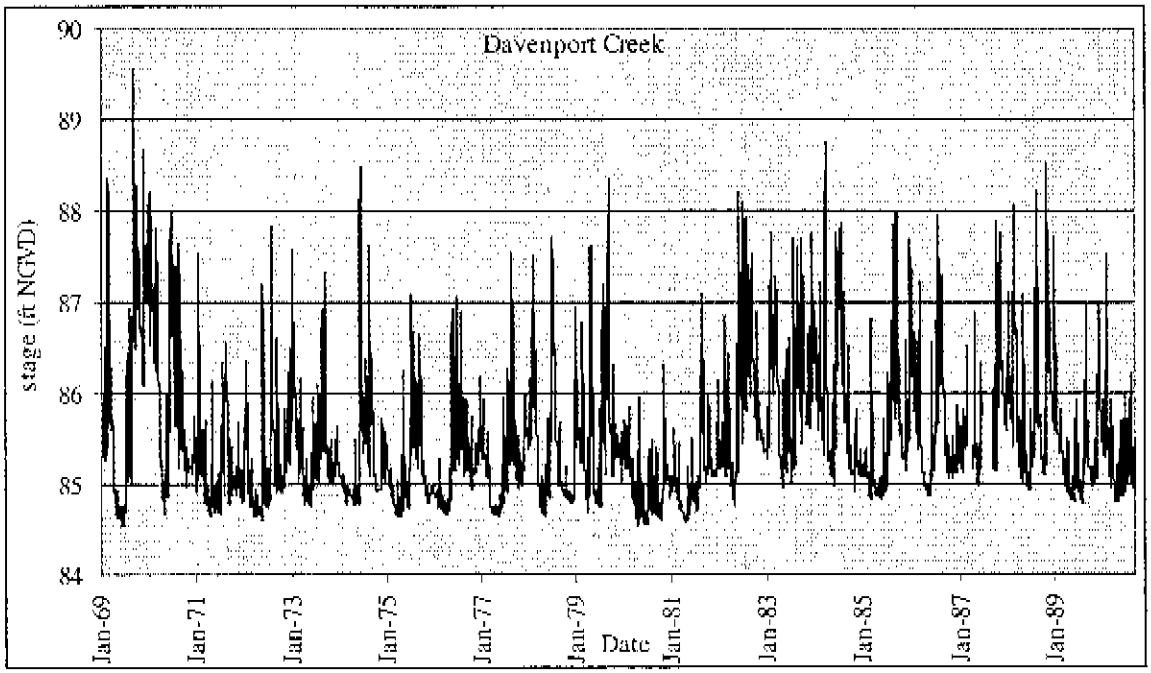

Figure C7-1. Historical daily stage at Davenport Creek.

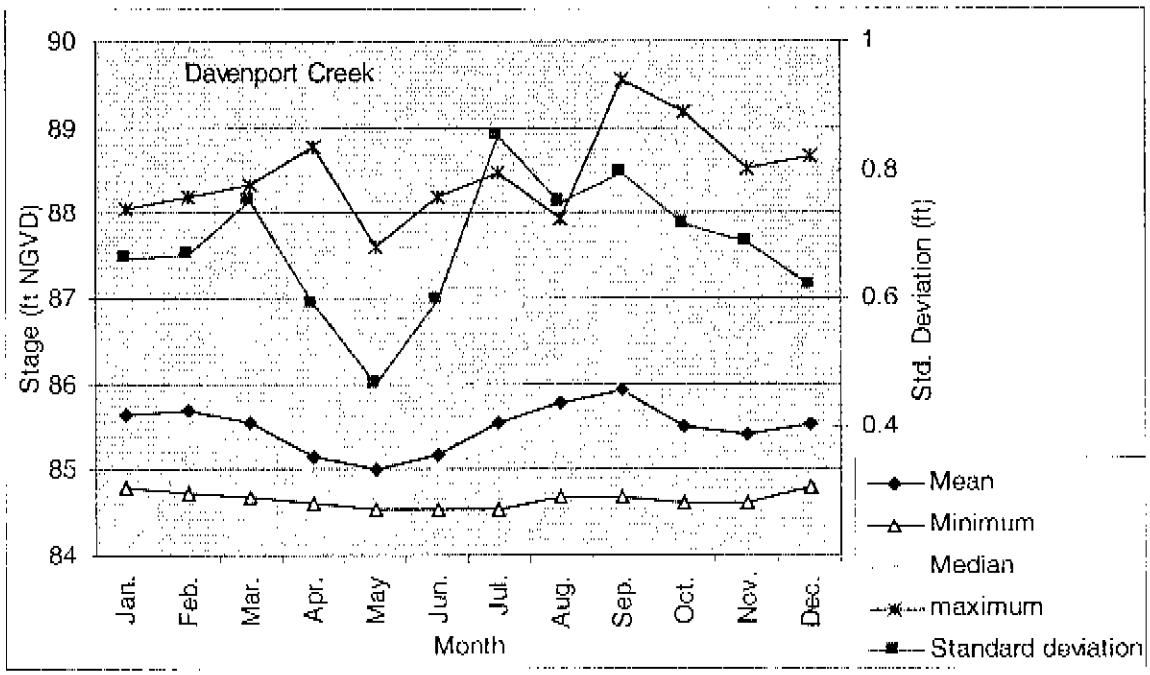

Figure C7-2. Monthly statistics for stage data at Davenport Creek.

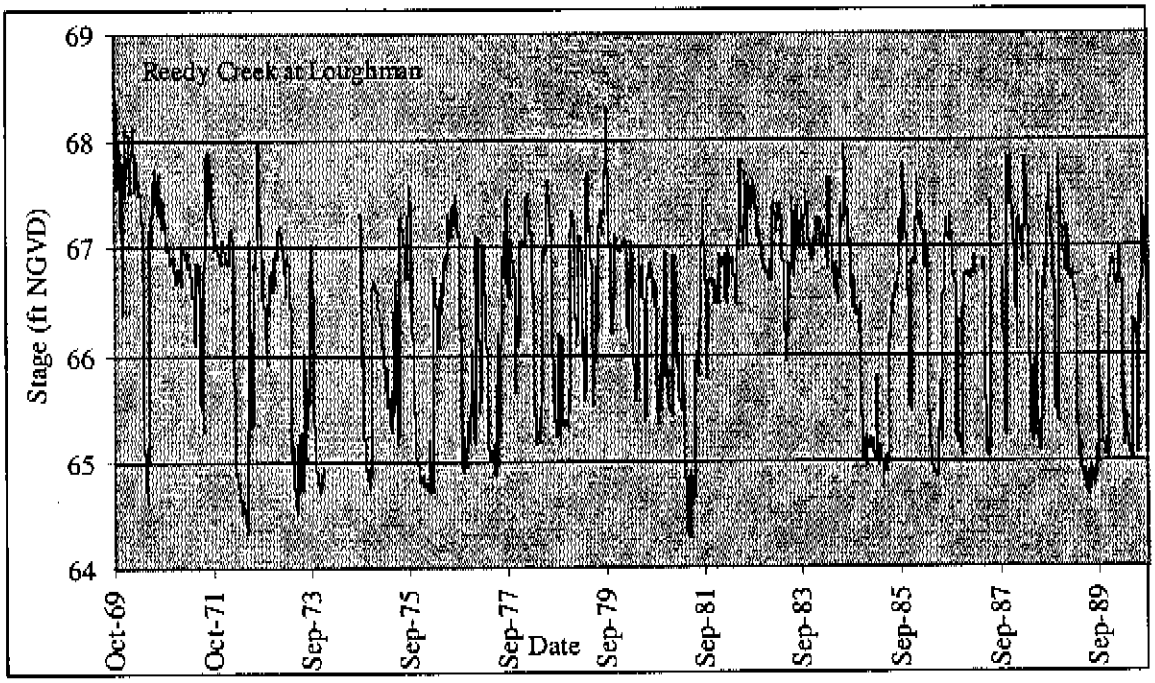

Figure C8-1. Historical daily stage at Reedy Creek at Loughman.

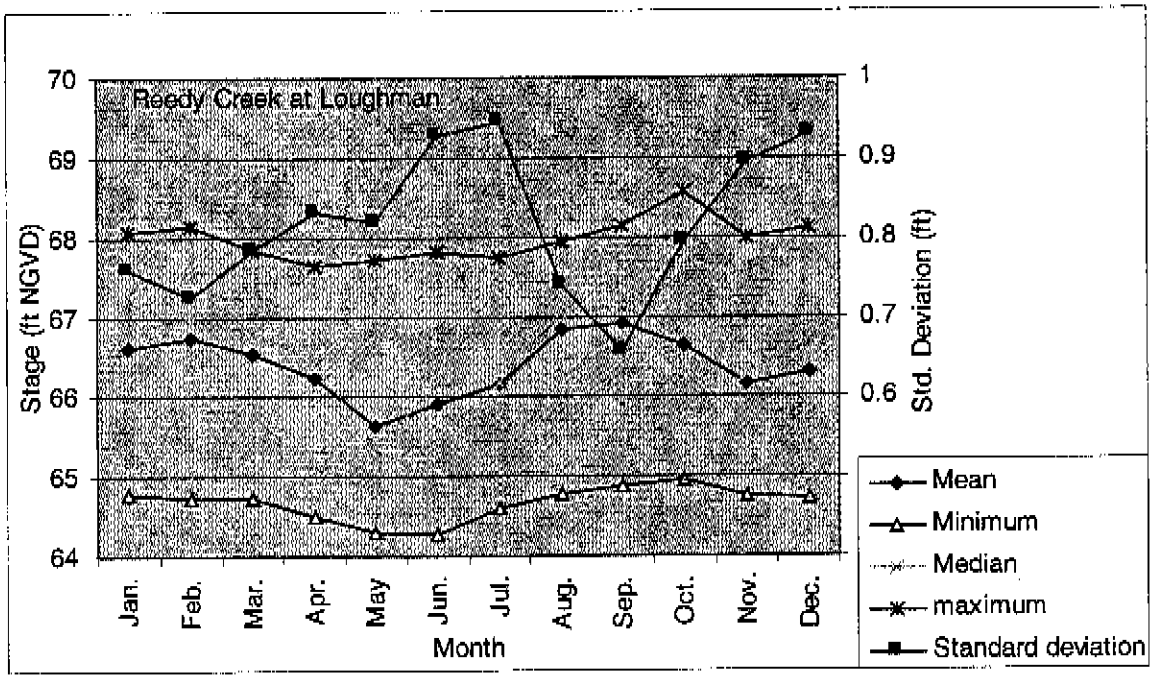

Figure C8-2. Monthly statistics for stage data at Reedy Creek at Loughman.

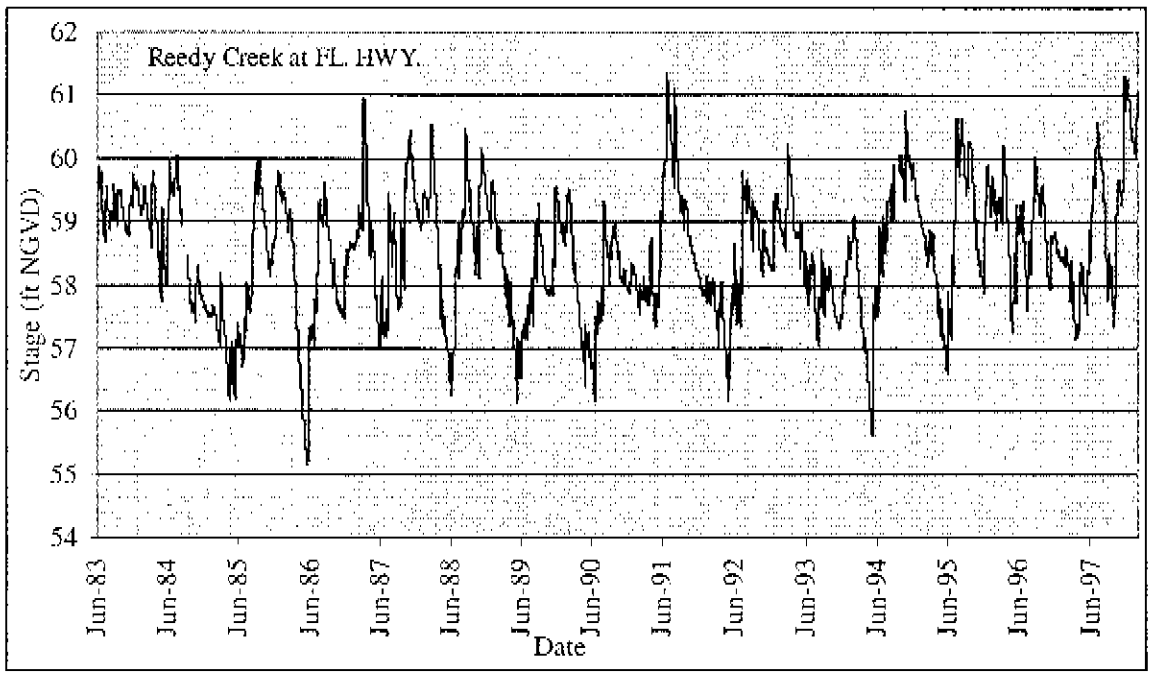

Figure C9-1. Historical daily stage at Reedy Creek at FL. HWY.

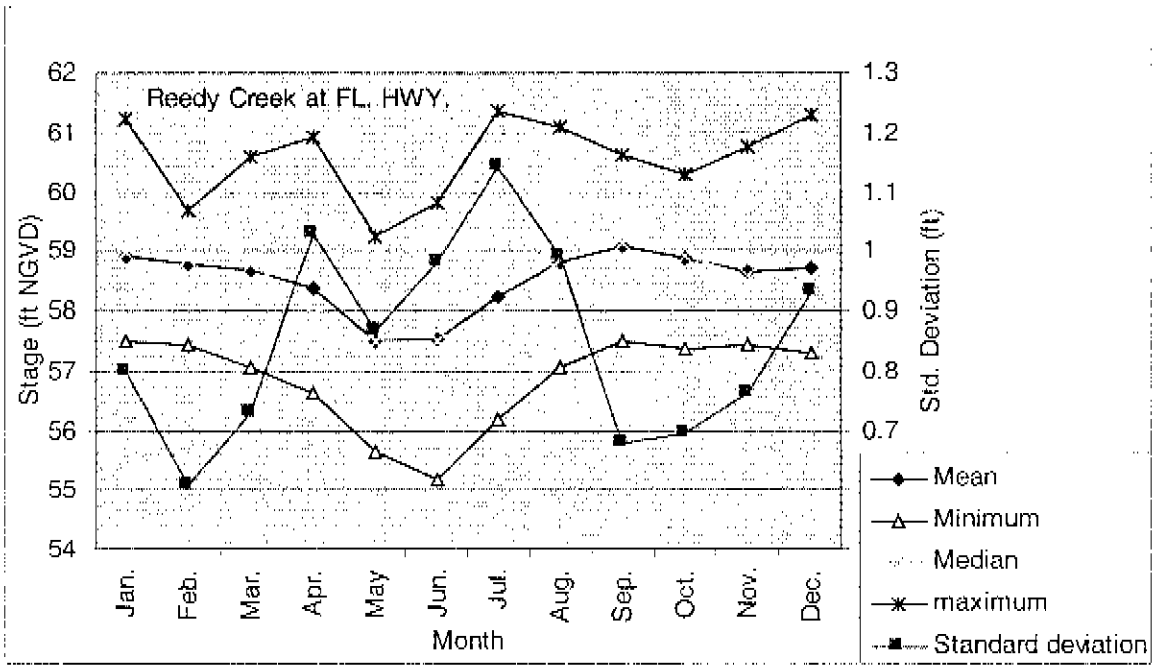

Figure C9-2. Monthly statistics for stage data at Reedy Creek at FL. HWY.

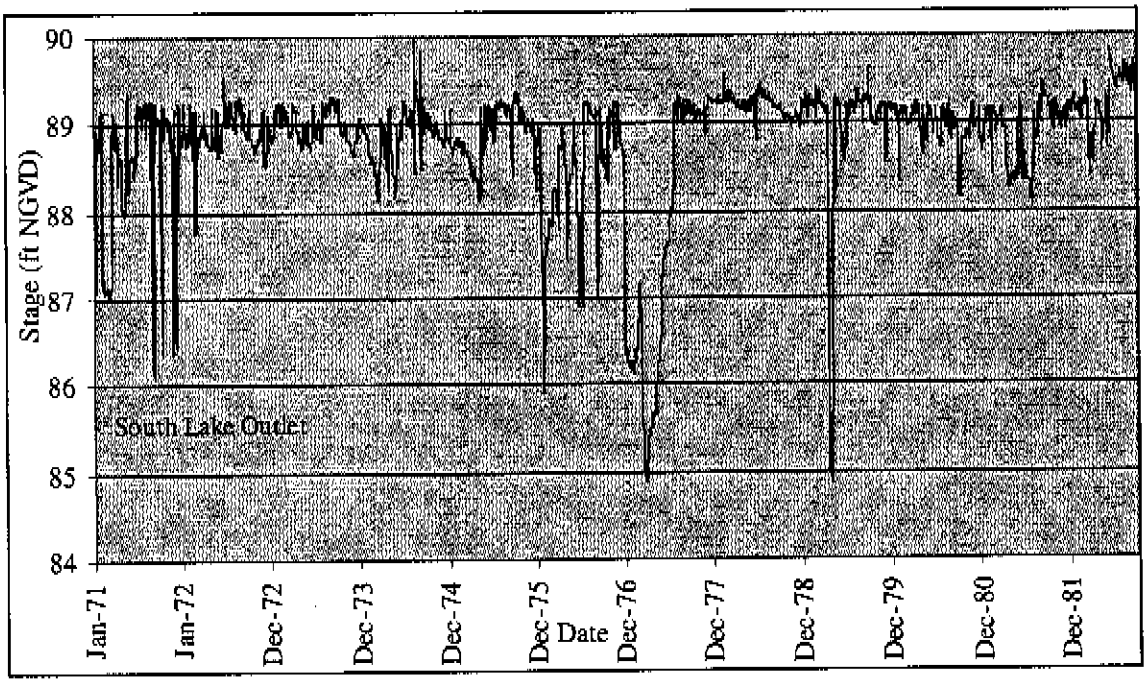

Figure C10-1. Historical daily stage at South Lake outlet.

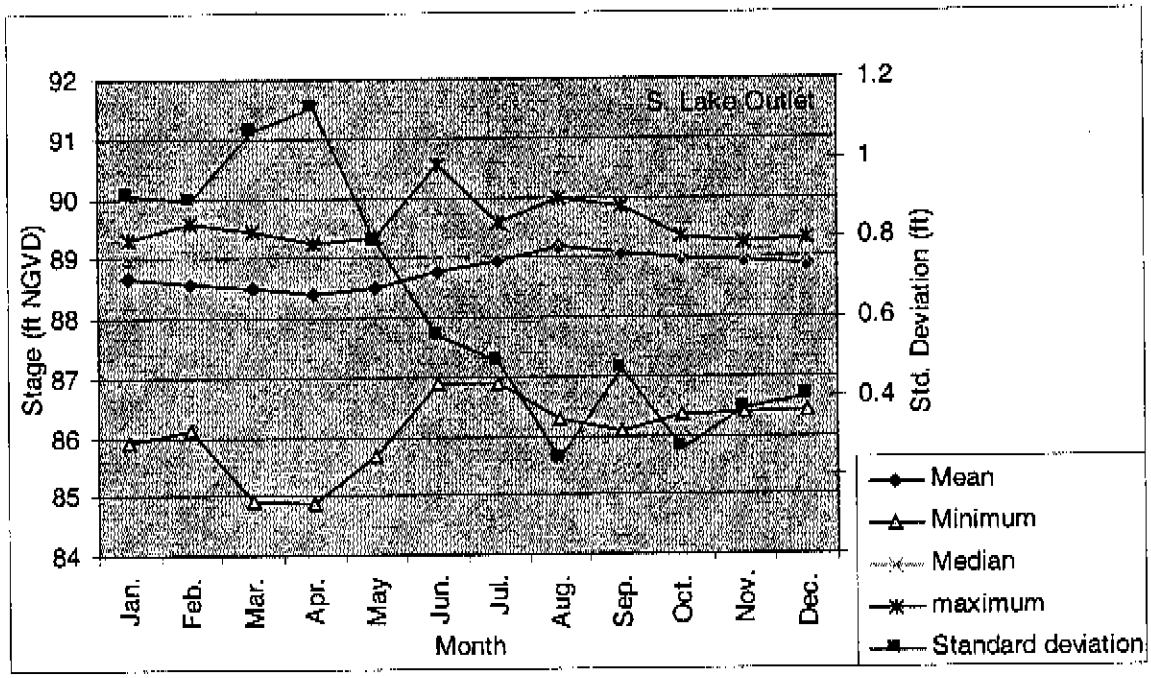

Figure C10-2. Monthly statistics for stage data at South Lake outlet.

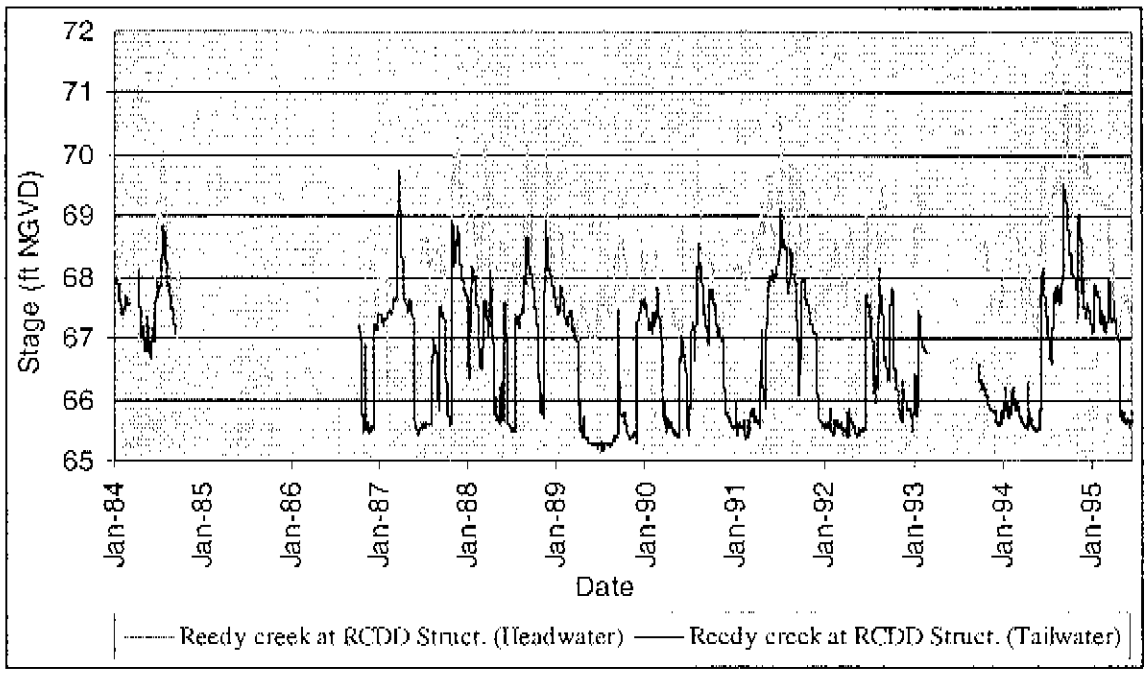

Figure C11-1. Historical daily stage at South Lake outlet.

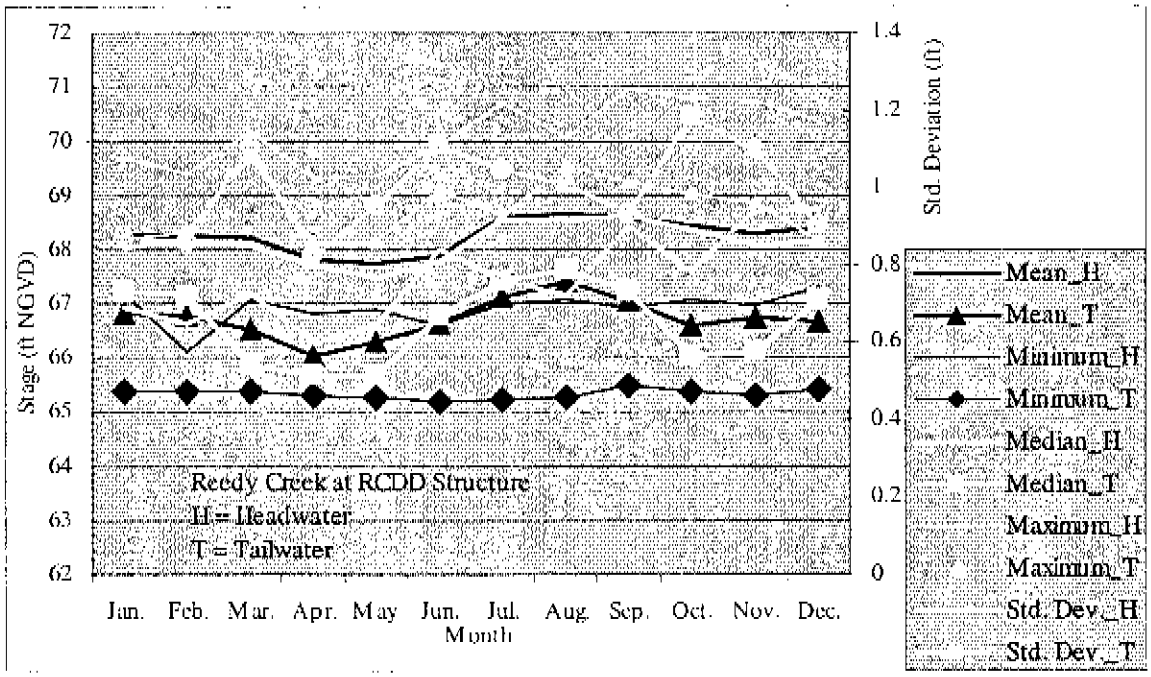

Figure C11-2. Monthly statistics for stage data (Headwater and Tailwater) at Reedy Creek, RCDD structure.

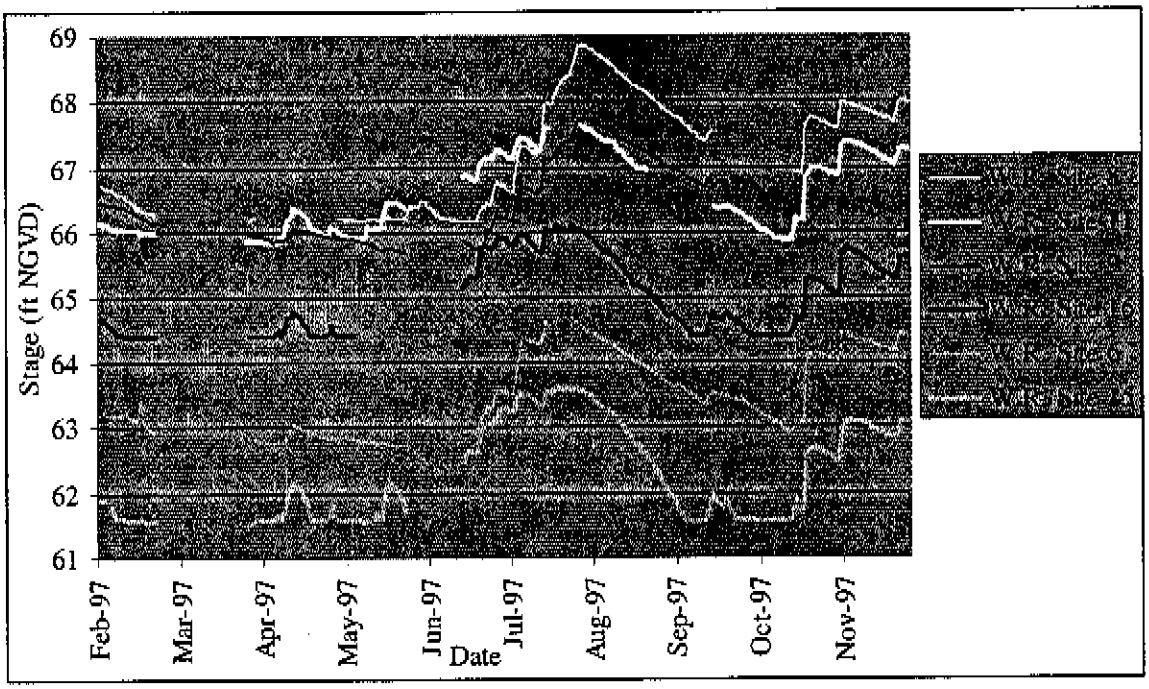

Figure C12-1. Historical daily average stage at Walker Ranch sites.

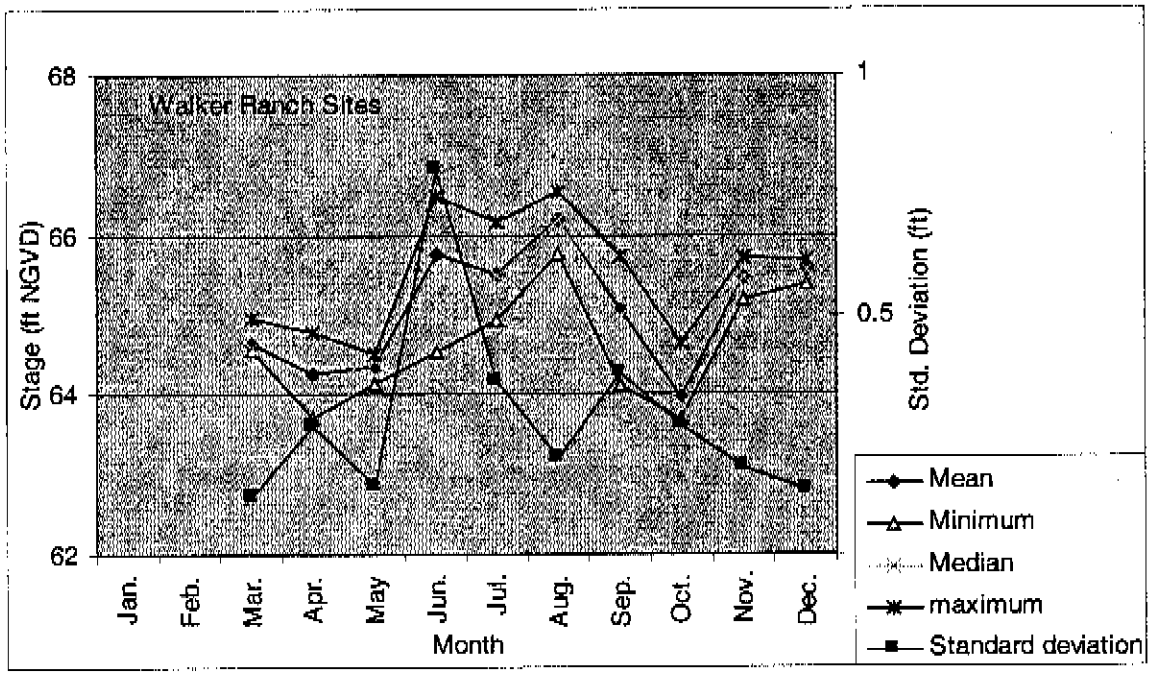

Figure C12-2. Monthly statistics for stage data at Walker Ranch sites.

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WRE/ERD MANUSCRIPT REVIEW
(Page 1 of 2)

For manuscripts with co-authors in both departments, the Senior Author and his/her department should conduct the review process. The department designee (Aumen, ERD or Redfield, WRE) of the junior author should be given copies of the manuscript and summary when it is submitted to the journal.

Title: Hydrologic Report of Reedy Creek Basin and Preferred Database Development		
Author(s): Alaa Ali		
	Initials	**Date**
Author(s) certify that the draft manuscript is complete, of high quality and free of typographical and other errors ☐ Develops one-pager (in lay language) for GB Submittal Executive summary ☐ Submits manuscript for internal review process		9/17/98
Suggested Internal Reviewers: R. Mieras, J. Chamberlin, S. Lin, D. Mitsch, Ed Yarn Hanna Ahn, Jim [redacted], Correa PLD		
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Author gives formally approved manuscript (including tracking sheet) to Division Administrative Associate		
Division Administrative Associate prepares cover memo and distributes draft manuscript and one-pager to internal reviewers (Cover memo will ask proposed reviewers to return comments directly to primary author)		Due 10/8/98

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Supervisor/Division Director agrees that reviewers' comments have been considered; submits revised manuscript, memo, and transmittal letter to Department Staff (Aumen or Redfield)	[signature]	2/22/99
Department agrees that reviewers' comments have been considered; returns revised manuscript, memo, and transmittal letter to Author Fine paper!!. ***Or*** **Department (Redfieldor Aumen) asks for revisions and returns manuscript to author**	[signature]	2/22/99
Author resubmits revised manuscript for approval from Department Staff, if required		
ERD/WRED Department Staff (Aumen/Redfield) approves manuscript for submittal to journal/society and returns to Division Administrative Associate		
Division Administrative Associate: ☐ **Mails manuscript and transmittal letter (prepared by author) to journal/society** ☐ **Obtains an electronic and hard copy of final product including one-pager from author** ☐ **ERD (only) submits electronic and hard copy of final product including one-pager to ERD Administrative Associate for inclusion in "Research Highlights" and to be placed into District's publication listing.; WRE submits a copy to department staff (Ginger Brooks) for internal processing (printing for distribution, listing, etc.) Authors are responsible for updating manuscript status.**		

Subject: **Hydrologic Report of Reedy Creek Basin and .....**
Date: Mon, 01 Feb 1999 14:21:08 -0500
From: "Alaa Ali" <aali@sfwmd.gov>
Organization: South Florida Water Management District
To: Jim Carnes <jcarnes@sfwmd.gov>, Steve Lin <slin@sfwmd.gov>
CC: Wossenu Abtew <wabtew@sfwmd.gov>, Alaa Ali <aali@sfwmd.gov>

Jim and Steve:
Thank you very much for your suggestions regarding the Reedy Creek Basin (RCB) Hydrologic report. I think your reviews were very constructive and the meeting was very useful. The report has gone through major revision to accommodate some of these comments. My response to these comments follows:
1) Flow, Rainfall, and stage stations will be presented on real maps for the RCB. Also, Lake Marion, Lake Pierce and Lake Polk will be added to the existing maps.

2) The flow part of the report has been re-computed and hence all issues raised in this section have been accommodated. The new section is based on:
a) A flow route based on an available literature pertaining to the RCB
U.S. Geological Survey, Water-Resources Investigations report 84-4250, 1986, Summary of Hydrologic Conditions in The Reedy Creek Improvement District, Central Florida. Prepared in Cooperation with the Reedy Creek Improvement District. Tallahassee, Florida..
This flow route is consistent with the one we discussed in our meeting.

b) Pre-67 and Post-67 data sets due to the construction of some control structures since 1967 (according to the same source of literature).

3) The Reedy Creek flow at Loughman recorded higher than that at Florida Highway during September and October due to mixing pre-67 and post-67 data together. In the revised report; i.e., after separating the pre-67 and post-67 data, the two values are almost the same during these two months. However, during June, July and August; Loughman flow is still higher. After consulting with Steve, it appeared that this is natural because the system storage increases during this period.

4) I added "cluster number" column to Table 4 corresponding to the stage station.

5) I re-computed rainfall statistics including the annual time series based on data from 1965 to 1998. This is because only one data set existed prior to 1965.

6) I included a comparison between mean annual evaporation at Lake Bay and that at lake Alfred.

If you have further questions, please let me know..
Alaa

Alaa Ali <aali@sfwmd.gov>
Sr. Engineer
Resources Assessment Division